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State of Connecticut
State Geological and Natural History Survey
BULLETIN NO. 8

BIBLIOGRAPHY

OF THE

GEOLOGY OF CONNECTICUT

By
HERBERT ERNEST GREGORY, Ph.D.,
Professor of Geology in Yale University

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U. S. GEOLOGICAL SURVEY
WASHINGTON, D. C.

State of Connecticut

PUBLIC DOCUMENT No. 47

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PREFACE.

During the past five years the undersigned has had occasion to examine critically the geological literature of Connecticut. The list of papers read, and the notes made during these years, are here presented, with the hope that they may be useful to students interested in the subject.

The list of titles is believed to be practically complete to January, 1906, and a few papers of more recent date have been added. Articles in the local newspapers, and descriptions in text-books have been omitted.

In preparing the notes an effort has been made wherever practicable to give the author's main conclusions, instead of describing the table of contents. This is not attempted with the larger and more general works. With the exception of a few instances, no attempt has been made to estimate the value of the various papers, and some have been included because of their historic interest. A list of geological maps, including those used as illustrations accompanying reports, follows the list of papers. The articles catalogued are numbered serially. Numbers from 500 upward are used for the maps.

Thanks are due to Mr. Freeman Ward for valuable and expert assistance in preparation of the notes, and to Miss Elfreda Cutting and Miss Lucy Bush for assistance in preparation of the Index.

The writer will be pleased to receive notice of errors in this bulletin, especially of omitted articles.

HERBERT E. GREGORY.

New Haven, April, 1907.

LIST OF PUBLICATIONS EXAMINED, TOGETHER WITH LIST OF ABBREVIATIONS USED.

A

Am. Acad. Arts Sci., Mem. Memoirs of the American Academy of Arts and Sciences.

Am. Assoc. Adv. Sci., Proc. Proceedings of the American Association for the Advancement of Science.

Am Geol. The American Geologist.

Am. Inst. Min. Eng., Trans. Transactions of the American Institute of Mining Engineers.

Am. Jour. Sci. The American Journal of Science.

Am. Min. Jour. The American Mineralogical Journal.

Am. Nat. The American Naturalist.

Am. Phil. Soc., Proc. Proceedings of the American Philosophical Society.

— — *Trans.* Transactions of the American Philosophical Society.

Assoc. Am. Geol., Trans. Transactions of the Association of American Geologists.

Atlantic Mon. The Atlantic Monthly.

B

Boston Soc. Nat. Hist., Mem. Memoirs of the Boston Society of Natural History.

— — *Proc.* Proceedings of the Boston Society of Natural History.

British Assoc. Adv. Sci., Rept. Report of the British Association for the Advancement of Science.

C

Can. Nat. The Canadian Naturalist.

Can. Rec. Sci. The Canadian Record of Science.

Census of U. S., Rept. Report of the Census of the United States.

Cincinnati Soc. Nat. Hist., Jour. Journal of the Cincinnati Society of Natural History.

Connecticut Acad. Arts Sci., Mem. Memoirs of the Connecticut Academy of Arts and Sciences.

— — *Trans.* Transactions of the Connecticut Academy of Arts and Sciences.

Connecticut Board Agric., Rept. Report of the Connecticut Board of Agriculture.

Connecticut Mag. The Connecticut Magazine.
Connecticut Quart. The Connecticut Quarterly.
Connecticut Sch. Doc. Connecticut School Document.
Connecticut State Geol. Nat. Hist. Surv., Bull. Bulletin of the Connecticut State Geological and Natural History Survey.

E

Eclectic Mag. The Eclectic Magazine of Foreign Literature, Science, and Art.
Eng. Min. Jour. Engineering and Mining Journal.

G

Geol. Mag. The Geological Magazine.
Geol. Soc. America, Bull. Bulletin of the Geological Society of America.
Geol. Soc. London, Proc. Proceedings of the Geological Society of London.
— — *Quart. Jour.* The Quarterly Journal of the Geological Society of London.
Geol. Surv. Pennsylvania (2d), Rept. Report of the Second Geological Survey of Pennsylvania.
Geol. Surv. Wisconsin. Geological Survey of Wisconsin.
Geol. Massachusetts, Final Rept. Final Report of the Geology of Massachusetts.
Geol. New Hampshire. Geology of New Hampshire.
Geol. Pennsylvania. Geology of Pennsylvania.

I

Internat. Cong. Geol., Rept. Am. Comm. International Congress of Geologists, Report of the American Committee.

J

Johns Hopkins Univ. Circ. Johns Hopkins University Circulars.
Jour. Geol. The Journal of Geology.
Jour. Phys. Chim. Journal de Physique, de Chimie, et de l'Histoire Naturelle, par J. C. de La Métherie.

L

Leonhard, Zeitsch. Zeitschrift für Mineralogie, von K. C. von Leonhard.

M

Macfarlane's Am. Geol. R. R. Guide. An American Geological Railway Guide, by James MacFarlane.

Meriden Sci. Assoc., Trans. Transactions of the Meriden Scientific Association.

Min. Mag. Jour. Min. Soc. London. The Mineralogical Magazine and Journal of the Mineralogical Society of London.

Mon. Weath. Rev. The Monthly Weather Review.

Mus. Comp. Zoöl., Bull. Bulletin of the Museum of Comparative Zoölogy, Harvard University.

N

Nat. Acad. Sci., Biog. Mem. Biographical Memoirs of the National Academy of Sciences.

— — *Mem.* Memoirs of the National Academy of Sciences.

Nat. Geog. Mon. National Geographic Monographs.

New York Acad. Sci., Ann. Annals of the New York Academy of Sciences.

— — *Trans.* Transactions of the New York Academy of Sciences.

Neues Jahrb. Neues Jahrbuch für Mineralogie, Geologie, und Palæontologie.

P

Petermann, Mittheil. Mittheilungen aus Justus Perthes' Geographischer Anstalt über wichtige neue Erforschungen auf dem Gesammtgebiete der Geographie, von A. Petermann.

Phil. Mag. The Philosophical Magazine.

Pop. Sci. Mon. The Popular Science Monthly.

S

Sch. Mines Quart. The School of Mines Quarterly.

Scient. Am. Supp. Scientific American Supplement.

Smithson. Contr. Knowl. Smithsonian Contributions to Knowledge.

— — *Report.* Annual Report of the Smithsonian Institution.

Soc. géol. France, Bull. Bulletin de la Société géologique de France.

T

Tech. Quart. The Technology Quarterly and Proceedings of the Society of Arts.

U

U. S. Dept. Agric., Bur. Soils, Rept. Field Oper. United States Department of Agriculture. Bureau of Soils. Report of the Field Operations of the Bureau of Soils.

U. S. Geol. Surv., Ann. Rept. Annual Report of the United States Geological Survey.

— — *Bull.* Bulletin of the United States Geological Survey.

— — *Geol. Atlas U. S.* Geologic Atlas of the United States Geological Survey.
— — *Min. Res. U. S.* Mineral Resources of the United States.
— — *Mon.* Monograph of the United States Geological Survey.
— — *Prof. Paper.* Professional Paper of the United States Geological Survey.
— — *Water-Supp. and Irr. Paper.* Water-Supply and Irrigation Paper.
U. S. Nat. Mus., Proc. Proceedings of the United States National Museum.

BIBLIOGRAPHY.

1. **Agassiz, J. L. R.**

   On the age of the Connecticut valley sandstones.
   Boston Soc. Nat. Hist., Proc., iii, 336, 337, 1850.

   Exception taken to Dr. Jackson's statement that the Connecticut sandstones are of Silurian age. Evidence of fossil fishes places the formation much later in geological time.

2. **Agassiz, J. L. R.**

   On Marcou's "Geology of North America."
   Am. Jour. Sci., (2) xxvii, 134-137, 1859.

   Defense of Marcou's good intentions and of some of his statements.

3. **Akerly, S.**

   Geology of the Hudson river and vicinity. 69 pp., 1 pl., New York, 1820.

   Questions Old Red Sandstone age of Connecticut river sandstone.

4. **Barbour, E. H.**

   The ancient inhabitants of the Connecticut valley.
   Connecticut Almanac, 37-58, 46 figs., 1889.

   A popular account of the tracks and other impressions occurring in the sandstone of Connecticut and Massachusetts.

5. **Benjamin, H. W.**

   Scenes in and around Granby.
   Connecticut Quart., i, 139, 140, 1895.

   Describes old copper mine and Newgate prison.

6. **Blake, W. P.**

   Review of a portion of the geological map of the United States and British provinces by Jules Marcou.

   Am. Jour. Sci., (2) xxii, 383-388, 1856.

   Enumeration and correction of numerous errors made by Marcou in the above work.

7. **Blake, W. P.**

   Glacial phenomena of Mill Rock near New Haven.
   Science, i, 146, 147, 1883.

   Rock marked by steep south slope, gentle north slope; by rounding, grooving, polishing.

8. **Bowman, H. L.**

On an occurrence of minerals at Haddam Neck, Connecticut, U. S. A.

Min. Mag. Jour. Min. Soc. London, xiii, 97-121, 4 figs., 1 pl., 1902.

Review: U. S. Geol. Surv., Min. Res. U. S. 841, 842, 1902.

Deposit is in vein of very coarse granite. The tourmalines and associated minerals occur in pockets lined with crystallized quartz and feldspar, and sometimes beryl. The following minerals are described mineralogically, chemically, crystallographically, also in regard to their optical properties: — green and pink tourmaline, albite, microcline, green and pink apatite, brown fluor, beryl, quartz, cookeite, lilac lepidolite, greenish white muscovite, and a peculiar pink fibrous variety of the same mineral. Other minerals: — green fluor, microlite, columbite.

9. **Brace, J. P.**

Observations of the minerals connected with the gneiss range of Litchfield county, Connecticut.

Am. Jour. Sci., (1) i, 351-355, 1819.

Location of the gneiss formation and its relation to the limestone, porphyritic granite or gneiss, and mica slate. Brief mention of minerals found in the region; carbonate of lime over the whole region; cyanite or sappar, especially at Harwinton and Litchfield; staurotide; quartz; petrosilex, common in Litchfield and Goshen; common opal, in Litchfield; rarely mica; schorl; feldspar; beryl; garnets; epidote, in Washington and Litchfield; tremolite, in Litchfield, Bethlehem, and Canaan; common asbestos in Washington and New Milford; augite, in Litchfield; hornblende, actinolite, steatite, chlorite, and porcelain clay, in Litchfield; graphite, in Cornwall; ores not common; red oxide of titanium, sparingly in Litchfield.

10. **Brongniart, A.**

Miscellaneous observations relating to geology, mineralogy, and some connected topics.

Am. Jour. Sci., (1) iii, 216-221, 222-226, 1821.

Mentions the serpentine of New Haven; notices the strong resemblance of the bituminous formation of Westfield, near Middletown, to that of the bituminous marl slates of the copper mines in the counties of Mansfield and Hesse in Germany; fish impressions in each are similar.

11. **Brush, G. J., and Dana, E. S.**

On a new and remarkable mineral locality at Branchville in Fairfield county, Connecticut; with a description of several new species occurring there.

Am. Jour. Sci., (3) xvi, 33-46, 114-123, 1878; xvii, 359-368, 1879; xviii, 45-50, 1879; xx, 257-284, 1880: xxix, 201-216, 1890.

Description of the physical characteristics, crystalline form, optical properties, chemical composition, and pyrognostics of various minerals.

obtained from a single vein of albitic granite at Branchville. The following is a list of the minerals found: Albite, quartz, muscovite, microcline, damourite, spodumene (and its alteration products), cymatolite, apatite, microlite, columbite, garnet, tourmaline, staurolite, eosphorite, dickinsonite, triploidite, rhodochrosite, reddingite, amblygonite (hebronite), vivianite, lithiophilite, uraninite, fairfieldite, fillowite, chabazite, killinite, natrophilite, hureaulite.

12. **Burr, H. T.**

Physical geography of the Connecticut lowland.
Connecticut Sch. Doc., No. 251, 1-17, 8 figs., 1904.

The Triassic area of Connecticut is made up of sandstones deposited in a narrow estuary, lavas, and intrusive rocks. The present topography is the result of faulting and of the establishment of streams on an ancient peneplain.

13. **Chapin, A. B.**

Junction of trap and sandstone, Wallingford, Connecticut.
Am. Jour. Sci., (1) xxvii, 104-112, 8 figs., 1835.

Maps of seven trap dikes. Detailed description of branching dike, contact phenomena, included sandstone fragments, etc.

(An unusually clear and complete description of effects of contact metamorphism; remarkable for this early date. — Ed.)

14. **Chapin, J. H.**

The Hanging Hills.
Meriden Sci. Assoc., Trans., ii, 23-28, 1886.

Brief description of the occurrence of the trap ridges around Meriden. Brief review of two theories for the origin of the trap ridges: 1. Each ridge was the result of eruption through a single vent; 2. (Davis) The traps were contemporaneous flows, since reduplicated by strike faulting. The author inclines more to No. 1.

15. **Chapin, J. H.**

The trap ridges at Meriden.
Meriden Sci. Assoc., Trans., iii, 35-36, 1888.

Brief mention of "ash bed" in anterior sheet of Lamentation Mountain.

16. **Chapin, J. H.**

The topographic survey of Connecticut.
Meriden Sci. Assoc., Trans., iv, 51-57, 1890.

A description of the method used in making the topographic map of 1893.

17. **Cochrane, H. E.**

Rocks and minerals of Connecticut.
Connecticut Sch. Doc., No. 104, 1-26, 1895.

List of minerals and rocks found occurring in the towns of the state, arranged according to Shepard's Minerals and Dana's Mineralogy.

18. **Cooper, T.**

On volcanoes and volcanic substances, with a particular reference to the origin of the rocks of the floetz trap formation.

Am. Jour. Sci., (1) iv, 204-241, 242-243, 1822.

Discusses action of water on stones and earth of globe's crust; gives large number of facts concerning volcanoes and their products; proves igneous origin of floetz trap by comparison with modern lavas, etc., as disproving the Wernerian theory that the floetz trap was of aqueous origin. In this discussion the trap formations of Connecticut are used as examples.

19. **Cornish, R. H.**

Glacial scratches in vicinity of Norfolk, Connecticut.

Am. Jour. Sci., (3) xxxix, 321, 1890.

Brief statement of direction of glacial striæ in the vicinity of Norfolk; mean direction is S. 33° E.

20. **Crosby, W. O.**

Notes on the geology of the sites of the proposed dams in the valleys of the Housatonic and Ten Mile rivers.

Tech. Quart., xiii, pp. 120-127, 1900.

The Housatonic river formerly flowed through the Ten Mile river and Swamp brook, through Pawling into the Croton drainage system; its present course through the crystallines is due to the fact that it was established on Cretaceous strata sloping southeastward, and has since maintained its direction in spite of later erosion; other changes have taken place in the river system, due to Glacial deposits. The site of the proposed dam in the Housatonic valley is about one mile south of Merwinsville, and of the dam in the Ten Mile valley about one-half mile above Webatuck.

21. **Dana, E. S.**

Trap rocks of the Connecticut Valley.

Am. Jour. Sci., (3) viii, 390-392, 1874; Am. Assoc. Adv. Sci., Proc., xxiii, pt. ii, 45-47, 1874. Abstract: Neues Jahrb., 427, 1875.

Microscopical and chemical description of the Connecticut traps; closely similar to trap from Nova Scotia, New Jersey, Pennsylvania, and North Carolina; composed of pyroxene, labradorite, and magnetite, with chrysolite and apatite; chlorite is present as alteration product. Two types: anhydrous (West Rock, etc.), and hydrous (Saltonstall ridge).

(This paper is "the first important memoir in Petrography published in this country."—Ed.)

22. **Dana, E. S.**

On the occurrence of garnet with the trap of New Haven, Connecticut.

Am. Journal Sci., (3) xiv, 215-218, 1877.

Description of garnets found in the trap of East Rock and Mill Rock. Brief description of the associated minerals,— magnetite, pyroxene, opalite, and calcite. Chemical analyses and drawings.

23. **Dana, E. S., and Brush, G. J.**

On a new and remarkable mineral locality at Branchville in Fairfield county, Connecticut; with a description of several new species occurring there.

Am. Jour. Sci., (3) xvi., 33-46, 114-123, 1878; xvii, 359-368, 1879; xviii, 45-50, 1879; xx, 257-284, 1880; xxix, 201-216, 1890.

See Brush and Dana, 11.

24. **Dana, J. D.**

Origin of the grand outline features of the earth.

Am. Jour. Sci., (2) iii, 381-398, 1847.

Discussion of the general trends of coast lines, mountain ranges, and groups of islands of the globe, including peculiarities of fissures as illustrated by Percival's map of the trap ranges ("courses of fissures") of Connecticut.

25. **Dana, J. D.**

On the plan of development in the geological history of North America.

Am. Assoc. Adv. Sci., Proc., x, 1-18, 1856; Am. Jour. Sci., (2) xxii, 335-349, map, 1856.

Development of the continent of North America, starting with a V-shaped area around Hudson Bay, by the action of two systems of forces, a southeast and southwest one. The red sandstones of Connecticut indicate the water line in the Jurassic period.

26. **Dana, J. D.**

[Review of] "Illustrations of Surface Geology," by E. Hitchcock.

Am. Jour. Sci., (2) xxiv, 430-433, 1857.

Summary of a general discussion of terraces. Hitchcock speaks of a "terrace epoch," when the terraces of the Connecticut river were made by the ocean, as the result of a general submergence and a gradual re-elevation of the continent.

27. **Dana, J. D.**

[Review of] "Geology of North America," by J. Marcou.

Am. Jour. Sci., (2) xxvi, 323-334, 1858.

Exposure and criticism of numerous incorrect statements made by Marcou in the above work.

28. **Dana, J. D.**

Reply to Prof. Agassiz on Marcou's "Geology of North America."

Am. Jour. Sci., (2) xxvii, 137-140, 1859.

Criticism of Marcou's errors and unfairness.

29. Dana, J. D.

On the geology of the New Haven region, with especial reference to the origin of its topographic features.

Am. Jour. Sci., (2) xlix, 275, 1870.

Topographic features produced by glaciers rather than by icebergs.

30. Dana, J. D.

Excursion to Hanging Hills of Meriden.

History of Wallingford, by C. H. S. Davis, 53-56, 1870.

The scenery and geological features of the Meriden region are described. The Quinnipiac and the Connecticut rivers owe their altered courses to the eruption of trap; the smaller streams were affected by post-Tertiary elevation. Between Berlin and Wallingford are eight fractures from which liquid rock issued. Only a small amount of rock has been worn by glaciers from the summits of the Hanging Hills.

31. Dana, J. D.

On the Quaternary, or post-Tertiary, of the New Haven region.

Am. Jour. Sci., (3) i, 1-5, 125, 126, 1871.

The drift of the New Haven region was the result of glacier rather than iceberg action; the Connecticut valley glacier was but the inferior portion of the great continental glacier.

32. Dana, J. D.

[Review of] "Historical notes of the earthquakes of New England, 1638-1869," by W. T. Brigham.

Am. Jour. Sci., (3) i, 304, 305, 1871.

227 earthquakes recorded since 1638. Dana calls attention to the fact that volcanoes and earthquakes are not necessarily related.

33. Dana, J. D.

On the Connecticut river valley glacier, and other examples of the glacier movement along the valleys of New England.

Am. Jour. Sci., (3) ii, 233-243, 1871.

Great valley depressions, as the Connecticut valley, influenced the direction of the flow of the continental glacier; in such valleys the ice movement was in the general direction of the valley.

34. Dana, J. D.

Triassic sandstone of the Palisade ranges.

Am. Jour. Sci., (3) ii, 459, 460, 1871.

The Connecticut sandstone contains orthoclase, and the New Jersey sandstones contain albite.

35. Dana, J. D.

Green mountain geology. On the quartzite.

Am. Jour. Sci., (3) iii, 179-186, 250-256, 1872.

Description of the quartzite of Canaan, Connecticut, Poughquag, New York, etc., and its general relation to the Green mountain quartzite, the crystalline limestone, and metamorphic schist; at Canaan the quartzite unconformably underlies the limestone.

36. **Dana, J. D.**

The character of trap near New Haven.

Am. Jour. Sci., (3) iv, 237, 1872.

Essential identity of the New Haven trap and Palisade (New Jersey) trap; iron in them is magnetic.

37. **Dana, J. D.**

On the quartzite, limestone and associated rocks of the vicinity of Great Barrington, Berkshire county, Massachusetts.

Am. Jour. Sci., (3) iv., 362-370, 450-453, map, 1872; v, 47-53, 84-91, 1873; vi, 257-278, 1873.

Description and general relations of the mica schist, gneiss, quartzite, and limestone of Canaan, South Canaan, and Falls Village; mention of the chloritic mica slate of the New Haven region, and the Taconic slates of Salisbury and Mount Washington.

38. **Dana, J. D.**

On the geology of the New Haven Region, with special reference to the origin of some of its topographic features.

Connecticut Acad. Arts Sci., Trans., ii, 45-112, map, 1873.

Description of the main geological features of the region. Geological events previous to the Glacial period, forming of sandstone and trap areas, subsequent elevation, erosion, etc. The Glacial period — conditions and results; events of post-Glacial time; various changes in level of the area; structure of the New Haven plain.

39. **Dana, J. D.**

On the Glacial and Champlain eras in New England.

Am. Jour. Sci., (3) v, 198-211, 217-219, 1873.

Summary of the facts, theories, and conclusions concerning the Glacial history of New England.

40. **Dana, J. D.**

On staurolite crystals and Green mountain gneisses of the Silurian age.

Am. Assoc. Adv. Sci., Proc., xxii, pt. ii, 25-27, 1873; Am. Nat., vii, 658-670, 1873; Can. Nat. (new ser.), vii, 163, 1875.

Mention of staurolite crystals, associated with garnet and their occurrence in mica schist which overlies the Stockbridge limestone at Falls Village. Facts drawn from the alternation of quartzite, limestone, gneiss or mica schist, showing that all old-looking Green mountain gneisses are not pre-Silurian, and that the presence of staurolite is no evidence of a pre-Silurian age.

41. **Dana, J. D.**

On southern New England during the melting of the great glacier.

Am. Jour. Sci., (3) x, 168-183, 280-282, 353-357, 409-438, 497-508, 1875; xi, 178-180, 1876; xii, 125-128, 1876.

Evidence of a flood from the melting of the glacier. Origin of the stratified estuary deposits of the New Haven plain; absence of marine life from these deposits. Discovery of reindeer bones in the clay of the Quinnipiac valley, between New Haven and North Haven. Discussion of the depression of the land and amount of subsequent elevation, through evidence furnished by terraces, estuary deposits, etc., in the river valleys of southern New England, especially in the New Haven region; the Connecticut valley before the glacial flood, when it overflowed its course in several places (in Connecticut, at Meriden). Damming of streams by drift ice during the melting of the great glacier. Discharge of the flooded Mill river into the Quinnipiac, and the effect, as registered in the drift deposits of the New Haven plain.

42. **Dana, J. D.**

On the damming of the streams by drift ice during the melting of the great glacier.

Am. Jour. Sci., (3) xi, 178-180, 1876.

Discussion of former ice dams at the narrows of several Connecticut rivers; evidenced by terraces. The Thames, Connecticut, Housatonic, Westfield, Farmington rivers are considered.

43. **Dana, J. D.**

On the relations of the geology of Vermont to that of Berkshire.

Am. Jour. Sci., (3) xiv, 37-48, 132-140, 202-207, 257-264, 1877.

The geology of the limestone region of the Green mountains (including northwestern Connecticut); stratigraphical relations of the limestones, quartzite, and schists, and the abundant occurrence of iron. Conclusions as to the chronological, lithological, and orographic relations of the formations.

44. **Dana, J. D.**

On "indurated bitumen" in cavities in the trap of the Connecticut Valley. From the report on the geology of Connecticut, by Dr. J. G. Percival.

Am. Jour. Sci., (3) xvi, 130-132, 1878.

Brief discussion of the origin of the "indurated bitumen" described by Percival as occurring in the amygdaloidal trap at Farmington, New Britain, Southbury, Rocky Hill, and Hartford; "bitumen" was distilled from the bituminous shales and limestones of the Triassic. (See Russell, 250.)

45. **Dana, J. D.**

On some points in lithology.

Am. Jour. Sci., (3) xvi, 335-343, 431-440, 1878; Can. Nat., (new ser.) ix, 40-48, 80-91, 1878.

Consideration and criticism of the value of some of the distinctive characters which are generally accepted at the present time, in defining certain kinds of rocks: 1. "Older" and "younger"; 2. Foliated or not; 3. Porphyritic structure; 4. Containing quartz or not; 5. Containing "plagioclase"; 6. Rocks consisting of a triclinic feldspar and mica; 7. Hornblendic or augitic; 8. Massive or schistose; 9.

Metamorphic or eruptive. Many illustrations from Connecticut localities, including labradiorite, diorite schist, and porphyritic granite, New Haven; granite, Stony Creek; limestone, Canaan.

46. Dana, J. D.

[Review of] "On the physical history of the Triassic formation in New Jersey and the Connecticut valley," by I. C. Russell.

Am. Jour. Sci., (3) xvii, 328-330, 1879.

Objection to Russell's statement that the Connecticut and New Jersey Triassic areas are the opposite parts of a once continuous anticline with a thickness of sandstone of 25,000 feet. (See Russell, 249, 251, 268.)

47. Dana, J. D.

On the Hudson river age of the Taconic schists, and on the dependent relations of the Dutchess county and western Connecticut limestone belts.

Am. Jour. Sci., (3) xvii, 375-388, map, 1879.

The Taconic schists are of the age of the Hudson river group; the limestone belts of western Connecticut and eastern New York are but outcropping bands of the Lower Silurian limestone formation, brought to the surface by a series of flexures.

48. Dana, J. D.

Note on the age of the Green mountains.

Am. Jour Sci., (3) xix, 191-200, 1880.

Evidence for embracing the whole region between the Connecticut and the Hudson (and to an unascertained distance beyond) within the limits of a Green mountain synclinorium of Lower Silurian age.

49. Dana, J. D.

On the geological relations of the limestone belts of Westchester county, New York.

Am. Jour. Sci., (3) xx, 21-32, 194-220, 359-375, 450-456, 3 pls., 1880; xxi, 425-443, 1 pl., 1881; xxii, 103-119, 313-315, 327-335, 1881.

Description and discussion of the general geological relations of the limestone, schist, and gneiss of New York and western Connecticut, to prove that these limestones and conformably associated metamorphic rocks are of Lower Silurian age.

50. Dana, J. D.

Dolerite (trap) of the Triassic-Jurassic area of eastern North America.

Am. Jour. Sci., (3) xxii, 230-233, 1881.

Criticism of Dr. Hawes's method of dolerite analysis by specific gravity mixture. The recognition of anorthite and albite as constituents of West Rock trap is not warranted by the facts. (See Hawes, 128, 129, 130.)

51. Dana, J. D.

On the relation of the so-called kames of the Connecticut river valley to the terrace formation.

Am. Jour. Sci., (3) xxii, 451-468, 1881.

Criticism of Upham's theory of kames. Concludes that the so-called "kames" are really part of the terrace formation. (See Upham, 283.)

52. Dana, J. D.

The flood of the Connecticut river valley from the melting of the Quaternary glacier.

Am. Jour. Sci., (3) xxiii, 87-97, 179-202, 360-373, 1 pl, 1882; xxiv, 98-104, map, 1882.

Abridged: Connecticut Almanac, 34-52, map, 1888.

Discussion of the general condition of the Connecticut and its tributaries during the progress of the flood; the origin of the channel-way of the river; the question as to which is the normal upper terrace in any part of the valley; dimensions, velocity, and discharge of the flooded river; the bearing of the facts on the retreat of the glacier; the question as to the elevation of the land.

53. Dana, J. D.

Geological age of the Taconic system.

Geol. Soc. London Quart. Jour., xxxviii, 397-408, map, 1882. (Read April 5, 1882.) Abstract: Phil. Mag., xiii, 373-374, 1882. Abstract by author: Am. Jour. Sci., (3) xxiv, 291-293, 1882.

All observers describe the schists and limestones of the Taconic area as conformable. They belong to one system, and have a high eastward dip. The limestone and schist are Lower Silurian, and the schist is the younger. Chief part of schists is of Hudson river age.

54. Dana, J. D.

Evidence from southern New England against the iceberg theory of drift.

Am. Assoc. Adv. Sci., Proc., xxxii, 195-198, 1883; Science, ii, 390-392, 1883.

Evidence: From — 1. The scratches and groovings over the rocks; 2. The transported bowlders and other materials; 3. The facts as to the relative level of land and sea (maximum difference of 35 feet between then and now), showing that the iceberg theory of drift is unsatisfactory for southern New England.

55. Dana, J. D.

[Review of] "Annual report of the state geologist of New Jersey for 1882," by G. H. Cook.

Am. Jour. Sci., (3) xxv, 383-386, 1883.

Objection to Cook's hypothesis that "the various areas of the red sandstone formation east of the Appalachians, from Massachusetts to South Carolina, were once in some way connected, and perhaps those farther northeast in the British provinces." Brief statement of the origin of the Jura-Trias of eastern North America.

56. Dana, J. D.

On the western discharge of the flooded Connecticut, or that through the Farmington valley to New Haven Bay.

Am. Jour. Sci., (3) xxv, 440-448, maps, 1883. Abridged: Connecticut Almanac, 34-52, map, 1888.

Arguments showing that the waters of the flooded Connecticut, coming through the Farmington valley, reached New Haven bay through the Mill valley rather than the Quinnipiac.

57. Dana, J. D.

[Review of] "On the relations of the Triassic traps and sandstones of the eastern United States," by W. M. Davis.

Am. Jour Sci., (3) xxv, 474-475, 1883.

Criticism of Davis's view that some of the traps are intrusive and some overflow; exception taken to the "overflow theory." (See Davis, 82.)

58. Dana, J. D.

Phenomena of the Glacial and Champlain periods about the mouth of the Connecticut valley — that is, in the New Haven region.

Am. Jour. Sci., (3) xxvi, 341-361, map, 1883; xxvii, 113-130, maps (pls. i, ii), 1883.

Description and discussion of the glacial phenomena in the New Haven region, including the sand plain and kettle-holes. There were two simultaneous movements of the glacier ice, one southwest, the other southeast.

59. Dana, J. D.

On the southward ending of a great synclinal in the Taconic range.

Abstract: British Assoc. Adv. Sci., Rept. 54th meeting, 729, 730, 1884.

The Taconic range is probably of the age of the Hudson river group or Llandeilo flags; a southern portion in southwestern Massachusetts and its continuation into Salisbury, Connecticut, is a broad tray-shaped synclinal; the area south is limestone, which comes out from beneath the dwindled, flattened-out, and worn-off mountain synclinal. (See Dana, 61.)

60. Dana, J. D.

[Review of] "Preliminary paper on the terminal moraine of the second glacial epoch," by T. C. Chamberlin.

Am. Jour. Sci., (3) xxviii, 228-231, 1884.

Review of Chamberlin's paper. Discussion of the theory as applied to the Connecticut valley, where no facts have been observed which indicate a second glacial epoch.

61. **Dana, J. D.**

On the southward ending of a great synclinal in the Taconic range.

Am. Jour. Sci. (3) xxviii, 268-276, map, 1884.

Discussion of the geological relations of limestone and schist of the Mount Washington portion of the Taconic range, which extends into northwestern Connecticut. (See Dana, 59.)

62. **Dana, J. D.**

Note on the origin of bedding in so-called metamorphic rocks.

Am. Jour. Sci., (3) xxviii, 393-396, 1884.

Discussion to prove that gneiss, schist, quartzite, etc., are parts of a stratified series. The production of schistose bedding by pressure has a very limited application; field evidence supporting this view at Stony Creek, Derby, Lime Rock, Canaan.

63. **Dana, J. D.**

On the decay of quartzite, and the formation of sand, kaolin, and crystallized quartz.

Am. Jour. Sci., (3) xxviii, 448-452, 1884.

Discussion of the formation of sand, kaolin, and crystallized quartz from feldspathic quartzite; mentions kaolin deposits of Sharon and Canaan.

64. **Dana, J. D.**

The till ridge of New Haven, called Round hill.

Am. Jour. Sci., (3) xxix, 66-67, 1885.

Brief consideration of Davis's criticism as to origin of this hill, as described by Dana in a previous article. Round hill deposited by waters descending through crevice in ice; objection by Davis to this method of origin, on the ground of absence of stratification, not well taken. (See Dana, 58; Davis, 81.)

65. **Dana, J. D.**

On the Taconic rocks and stratigraphy, with a geological map of the Taconic region.

Am. Jour. Sci., (3) xxix, 205-222, 437-443, map (pl. ii), 1885.

Presentation of facts bearing on the constitution, stratigraphical relations, and distribution of Taconic rocks. Limestone is single formation overlain by schist and quartzite and underlain by quartzite and mica schist. Within the Taconic region metamorphism increases from north to south and from west to east.

66. **Dana, J. D.**

On displacement through intrusion.

Am. Jour. Sci., (3) xxx, 374-376, 1885.

Description of the wedging action of intruding material, as shown in specimens from Canaan and Lenox.

67. **Dana, J. D.**

[Review of] "Gradual variation in intensity of metamorphism," by C. S. Middlemiss.

Am. Jour. Sci., (3) xxxv, 82-83, 1888.

Abstract of Middlemiss's statements in regard to the metamorphic phenomena of India, and brief comparison with similar phenomena in New England.

68. **Dana, J. D.**

[Review of] "Subaërial decay of rocks and origin of the red color of certain formations," by I. C. Russell.

Am. Jour Sci., (3) xxxix, 317-319, 1890.

In contrast with Russell's views Dana believes that the absence of red earth in the crystallines is due to the character of the oxidation, and that the red color of the sandstones is due to changes subsequent to deposition. (See Russell, 252.)

69. **Dana, J. D.**

Archæan limestone and other rocks in Norfolk, Connecticut.

Am. Jour. Sci., (3) xxxix, 321, 1890.

Brief mention of a small area of limestone associated with hard gneiss, granite, and some hornblendic rocks, at Norfolk; limestone considered as Archæan. Brief mention of magnetite vein two and one-half miles east of Norfolk, that had been opened and worked for a time.

70. **Dana, J. D.**

Archæan axes of eastern North America.

Am. Jour. Sci., (3) xxxix, 378-383, 1890.

Division of eastern North America into ranges and troughs which were areas, for the most part, of independent geological work. Mentions a Connecticut valley trough.

71. **Dana, J. D.**

On the four Rocks of the New Haven region. 120 pp., 7 pls., maps (pls. i-iii, vi), New Haven, 1891.

Detailed description of East Rock, West Rock, Pine Rock, and Mill Rock. They are intrusions of dolerite into upturned sandstone. East Rock and West Rock are of laccolithic origin. Pine Rock and Mill Rock are trap dikes. "Mount Carmel appears to be a combination of dikes." Pp. 41-120 describe the geology along certain walks and drives about the New Haven region, including Meriden, Maltby Park, Woodbridge, the shore line from Savin Rock eastward, including excursions to Branford, Stony Creek, and the Thimble Islands, Saltonstall ridge, and the North Haven clay deposits.

72. **Dana, J. D.**

Some of the features of non-volcanic igneous ejection, as illustrated in the four "rocks" of the New Haven region — West Rock, Pine Rock, Mill Rock, East Rock.

Am. Jour. Sci., (3) xlii, 79-110, 6 pls., maps (pls. ii, iii, vi), 1891.

Detailed description, with maps, sketches, and photographs, of the four "rocks" of New Haven. Pine Rock and Mill Rock are dikes; East Rock and West Rock are intrusions of a laccolithic character. (See Dana, 71.)

73. **Dana, J. D.**

On Percival's map of the trap belts of central Connecticut, with observations on the upturning, or mountain-making disturbance, of the formation.

Am. Jour. Sci., (3) xlii, 439-447, map (pl. xvi), 1891.

Citation of the facts favoring ejection of trap after the great mountain-making event of the valley; discussion of the character of this mountain-making disturbance.

74. **Dana, J. D.**

Additional observations on the Jura-Trias traps of the New Haven region.

Am. Jour. Sci., (3) xliv, 165-169, 1892.

Description of a 5-inch trap dike at West Rock, branching from the main rock mass.

75. **Dana, J. D.**

Manual of geology, 4th ed. 1,036 pp., 1,577 figs. and maps. New York, American Book Co., 1895.

Among the subjects dealing with Connecticut are Branchville mine, 321; Thimble islands, 949; copper mines, 745; iron mines, 127; marble deposits, 524, 530, 531; Triassic, 111, 740-742, 751-755, 799-801; glacial deposits, 194, 195, 443, 956, 970, 971; structure and age of Stockbridge limestone and related rocks, 309, 527-532; Taconic system, 495-496; Triassic strata were deposited in a valley and the traps are intrusive, 798-808; fossils 750-756.

(Dana's Manual is particularly rich in references to Connecticut geology.— *Ed.*)

76. **Dana, James Dwight. (1813-1895.)**

Biography.

E. S. Dana: Am. Jour. Sci., (3) xlix, 1-28, 1895.

Beecher: Am. Geol., xvii, 1-16, 1896.

Williams: Jour. Geol., iii, 601, 1895.

Le Conte: Geol. Soc. America, Bull., vii, 461-479, 1896.

Gilman: The life of James Dwight Dana, Harper and Brothers, New York, 1899.

77. **Davis, C. H. S.**

The Catopterus gracilis.

Meriden Sci. Assoc., Trans., ii, 19-22, 1886.

Description of a fossil fish, *Catopterus gracilis,* found in the bituminous shales at Little Falls, about two miles north of Durham Center.

78. **Davis, W. M.**

Brief notice of observations on the Triassic trap rocks of Massachusetts, Connecticut, and New Jersey.

Am. Jour. Sci., (3) xxiv, 345-349, 1882.

Occurrence of traps in three distinct conditions: 1. Dikes; 2. Intruded sheets; 3. Overflow sheets. Discussion of origin, etc.

79. **Davis, W. M.**

The structural value of the trap ridges of the Connecticut valley.

Boston Soc. Nat. Hist., Proc., xxii, 116-124, 1882.

Discussion of the Triassic problem, particularly in the Connecticut valley. Connecticut strip of sandstone not greatly reduced from its original area; its dip not the result of oblique deposition, but of post-Triassic disturbance; most of the trap ridges are edges of contemporaneous overflows of lava, so may be considered as conformable members of the sedimentary series, and serve as horizons to locate reduplication of strata by (strike) faulting; the curvature, as well as the occasional reappearance of the trap ridges, is the result of folding and faulting. (See Davis, 98.)

80. **Davis, W. M.**

Abstract of "High river terraces of eastern Connecticut," by B. F. Koons.

Science, i, 19, 1883.

Position of several terraces depends on ice-dams that existed during the decline of the Glacial period. (See Koons, 181.)

81. **Davis, W. M.**

The distribution and origin of drumlins.

Am. Jour. Sci., (3) xxviii, 407-416, 1884.

The place of drumlins in a geographical classification; terminology; general description; distribution; origin — similar to that of sand-bars in a river; discusses distribution and origin of some Connecticut drumlins. (See Dana, 58,64.)

82. **Davis, W. M.**

On the relations of the Triassic traps and sandstones of the eastern United States.

Mus. Comp. Zoöl., Bull., vii, 249-309, 1884. Abstract: Neues Jahrb., 230-232, 1884; Science i, 430, 1883.

Description of the Triassic formation seen at various places in New Jersey, Massachusetts, and Connecticut — Beckley Station, Meriden, Wallingford, New Haven. Brief statement of former views; literature; discussion of the general relations and origin of the trap and sandstones; extrusive nature of most of the trap proved. (For complete treatment of subject, see Davis, 98.)

83. **Davis, W. M.**

The structure of the Triassic formation of the Connecticut valley.

U. S. Geol. Surv., 7th Ann. Rept., for 1885-86, 455-490, 1 pl., 1888. Abstract: Am. Geol., iv, 112, 113, 1889.

Discussion of the conditions of accumulation of sandstones, shales, limestones, intrusive and extrusive flows, dikes. Discussion of the structure of the formation,— general attitude, faults and their systematic arrangement, low folds. Discussion of the mechanical origin of the formation. (See Davis, 98.)

84. Davis, W. M.

The structure of the Triassic formation of the Connecticut valley.

Am. Jour. Sci., (3) xxxii, 342-352, 1886.

Discussion proving that the disturbance of the strata took place after the period of deposition; was not caused by overflow or intrusion of trap sheets; was not a single monoclinal tilting. The whole region has been cut by a series of strike faults. Discussion of origin of crescentic ridges, and of probable character of the disturbing force. (See Davis, 98.)

85. Davis, W. M.

Results of a study on the mechanical origin of the Triassic monoclinal in the Connecticut valley.

Boston Soc. Nat. Hist., Proc., xxxiii, 339-341, 1886.

Explanation of the Triassic monoclinal given in the following statement: "Whenever unconformable masses are deformed together, the structure given to the lesser, relatively superficial mass must depend in great part on the changes in the surface shape of the greater, deeper mass below." Schists and gneisses have slipped on each other because of lateral pressure. Proof: strike of surface faults corresponds with the strike of the schist beneath.

86. Davis, W. M.

The mechanical origin of the Triassic monoclinal in the Connecticut valley.

Am. Assoc. Adv. Sci., Proc., xxxv, pp. 224-227, 1887.

Monoclinal faulting due to slipping of underlying schists and gneisses along their vertical cleavage planes. (See Davis, 85, 98.)

87. Davis, W. M.

The ash bed at Meriden and its structural relations.

Meriden Sci. Assoc., Trans., iii, 23-30, 1888.

(See Davis, 98.)

88. Davis, W. M.

The faults in the Triassic formation near Meriden.

Mus. Comp. Zoöl., Bull., xvi, 61-87, 5 pls., 1889.

(See Davis, 98.)

89. Davis, W. M.

Topographic development of the Triassic formation of the Connecticut valley.

Am. Jour. Sci., (3) xxxvii, 423-434, 1889. Abstract: Pop. Sci. Mon., xxvi, 573, 1889.

Discusses mechanism of monoclinal faulting; topographic development of the Triassic belt, etc. (See Davis, 85, 86, 98.)

90. **Davis, W. M.**

Remarks on structure of fillings of fissures in trap at Meriden.

Geol. Soc. America, Bull., i, 442, 1890.

Brief mention of the fact that detrital material supplied from above takes a horizontal stratification as it settles into fissures in the trap of the quarry at Meriden. (See Davis, 98.)

91. **Davis, W. M.**

Physical geography of southern New England.

Johns Hopkins Univ. Circ., x, No. 87, 78, 79, 1891.

Chief variety of form of southern New England is found in the valleys etched beneath the general surface; the upland is a peneplain; southern New England a region of ancient deeply buried rocks, consisting of "greatly distorted and overturned schists and bedded rocks." "The present altitude of the highlands is the result of subsequent massive elevation;" the hills that lie above the peneplain are remnants of the late Cretaceous surface, and the valleys of post-Cretaceous date; the effect of glaciation and the action of currents and waves upon the shore line is described. (See Davis, 96.)

92. **Davis, W. M.**

The Triassic sandstone of the Connecticut valley.

Johns Hopkins Univ. Circ., x, No. 87, 79, 1891.

Four stages of the formation are pointed out: 1. Accumulation of sandstone and shale with sheets of lava, and at least one great intrusive sheet; 2. Post-Triassic stage of tilting and faulting; 3. Reduction of the elevated mass to a peneplain during Jurassic and Cretaceous time; 4. In Tertiary time, gentle uplifting and tilting to the south or southeast. After this period the streams cut the valleys down nearly to a new base-level. (See Davis, 96, 98.)

93. **Davis, W. M.**

The Triassic formation of Connecticut.

Geol. Soc. America, Bull., ii, 415-424, 1891.

Discussion of the structure and origin of the Triassic formation, particularly of the area around Meriden; Mount Carmel mentioned as a possible vent through which the lava of the trap sheets rose to the surface. (For complete discussion of Triassic formation, see Davis, 98.)

94. **Davis, W. M.**

The geological dates of origin of certain topographic forms on the Atlantic slope of the United States.

Geol. Soc. America, Bull., ii, 545-586, 1891. Abstract: Am. Geol., viii, 260, 1891.

Classification of topographic forms according to age or degree of development. Description of the topographic forms of the Atlantic

slope, including the resurrected pre-Triassic and the uplifted Cretaceous peneplain of southern New England. Also the Tertiary excavation in the Cretaceous peneplain.

95. **Davis, W. M.**

The lost volcanoes of Connecticut.
Pop. Sci. Mon., xl, 221-235, 1892.

Mount Carmel may be the volcanic neck or the remains of the plug in the vent through which the volcanic material of the Connecticut valley was thrown out, particularly the ash and bombs at Lamentation Mountain.

(The evidence that Mount Carmel was a volcano which furnished the Triassic lavas is unsatisfactory.— *Ed.*)

96. **Davis, W. M.**

The physical geography of Southern New England.
Nat. Geog. Mon., i, 269-304, 6 figs. New York, American Book Co., 1895.

The subject is discussed under the following heads: 1. Upland of Southern New England,— its general features, origin, peneplain, monadnocks; 2. Valleys in the upland,— slanting of peneplain, revival of rivers, depth and breadth of valleys, Connecticut valley lowland, lava ridges, distribution of population; 3. Glacial invasion,— forms of drift, geographical consequences; 4. Coast-line, depression, modification by waves and currents.

97. **Davis, W. M.**

The quarries in the lava beds at Meriden, Connecticut.
Am. Jour. Sci. (4) i, 1-13, 3 figs., 1896.

Description of the quarries in the Triassic formation at Meriden, showing the vesicular upper surface of one lava bed under the dense basal portion of a later flow, and a number of fractures dislocating the double flow. Relation of these features to the geological structure of the district. (See Davis, 98.)

98. **Davis, W. M.**

The Triassic formation of Connecticut.
U. S. Geol. Surv., 18th Ann. Rept., pt. ii, 9-192, 20 pls., 52 figs., 1898.

Detailed description and discussion of the origin and formation of the Triassic under three main heads: 1. Deposition,— the floor of the older rocks; Triassic strata; igneous rocks, intrusive and extrusive (anterior, main, and posterior sheets); vulcanism; isostasy; relation of deposition and deformation. 2. Deformation,— changes from original attitude, warps, faults. 3. Denudation,— general principles of land sculpture; cycles of denudation; initial form of monoclinal faulting; Cretaceous peneplain; Tertiary dissection of the uplifted peneplain; Glacial modifications of form and drainage; review of origin of drainage. Previous studies of the Connecticut Triassic. The extrusive nature of most of the trap formations is proved. The present arrangement of ridges is shown to be due mainly to a uniform system of faulting; and these fault lines are preserved in the topography of the region.

(This is the most important single contribution to the geology of central Connecticut, and in it is included practically all the matter

covered in the other papers by Davis, and those by Griswold and by Whittle.— *Ed.*)

99. **Davis, W. M., and Griswold, L. S.**

Eastern boundary of the Connecticut Triassic.

Geol. Soc. America, Bull., v, 515-530, 1894. Abstract: Am. Geol., xiii, 145, 146, 1894; Am. Jour. Sci., (3) xlvii, 136, 137, 1894.

General geological history of the region given. Special discussion of faults. Evidence showing that the entire eastern boundary of the Triassic formation in Connecticut is defined by fault lines. (See Davis, 98.)

99a. **Davis, W. M., and Loper, S. W.**

Two belts of fossiliferous black shale in the Triassic formation of Connecticut.

Geol. Soc. America, Bull., ii. 415-430, 1891.

General stratigraphy of the formation. Special account of fossils of the two strata of black shale. (See Loper, 189.)

100. **Davis, W. M., and Whittle, C. L.**

The intrusive and extrusive Triassic trap sheets of the Connecticut valley.

Mus. Comp. Zoöl., Bull., xvi, 99-138, 1 pl., 1889.

Statement of the means of distinguishing intrusions and extrusions. General features and discussions of intrusive and extrusive sheets in the following localities of Connecticut: East and West Rock, New Haven; Gaylord's mountain, Roaring brook, Cheshire; anterior at north end of Totoket; ½ mile southeast of East Meriden; north end of Higby mountain; south and west of Chauncy peak; anterior of Lamentation mountain; anterior of Cat Hole peaks; anterior of Notch mountain; anterior of Shuttle Meadow mountain; anterior of Farmington mountain: Farmington river gap; Saltonstall mountain; Totoket mountain, inside south and north brooks; Higby mountain; Lamentation mountain; Meriden city quarry; 1st and 2d ridges posterior to Saltonstall mountain; ridge near Middlefield station; falls of the Aramamit river; Highland lake; Hartford avenue and North Stanley street, New Britain; near Trinity College, Hartford. (See Davis, 98.)

101. **Deane, J.**

Ichnographs from the sandstone of the Connecticut valley. 61 pp., 46 pls. Boston, Little, Brown and Co., 1861.

The incomplete papers of Dr. Deane, compiled and edited by T. T. Bouvé, H. I. Bowditch, A. A. Gould, and others.

(Doubt is cast on the bird origin of the footprints, and Deane's part in the discovery of the first specimens is magnified.— *Ed.*)

102. **Des Cloiseaux, A. L. O.**

Optical examination of the red feldspar of the granite from Lyme, Connecticut.

Am. Jour. Sci., (3) xx, 335-336, 1880.

Brief description of the microcline from the coarse granite of the MacCurdy quarry at Lyme.

103. **Dewey, C.**

A sketch of geology and mineralogy of the western part of Massachusetts and a small part of the adjoining states.
Am. Jour. Sci., (1) viii, 1-60, 240-244, map, 1824.

Description of the occurrence, general relations, and character of the mica slate, granular limestone and quartz rock found in the northwestern part of Connecticut. Mentions the following minerals: garnet, staurotide, schorl, cyanite, tremolite, nephrite, calcareous tufa, clay, some zinc mineral, also iron ores from Salisbury.

104. **Dobson, P.**

Remarks on bowlders.
Am. Jour. Sci. (1), x, 217, 218, 1826.

Description of sandstone bowlders worn smooth on one side and exhibiting scratches and furrows on the abraded part, found below as well as at the surface. "Have been worn by being suspended and carried in ice, over rocks and earth, under water." (See Dobson, 105.)

(The observations of Peter Dobson, a cotton manufacturer of Vernon, were keen, and his views of glaciation were far in advance of his time. Mr. Dobson received the enthusiastic endorsement of Murchison in the Annual Address of the Geological Society of London, 1842.— *Ed.*)

105. **Dobson, P.**

Hints on the iceberg theory of drift.
Am. Jour. Sci. (1), xlvi, 169-172, 1844.

Describes striated, subangular bowlders, which indicate work of ice,— presumably icebergs. (See Dobson, 104.)

(This letter of Mr. Dobson's was written to Prof. Hitchcock, November 15, 1837, and sent to the *American Journal of Science* in 1844.— *Ed.*)

106. **Dorsey, C. W., and Bonsteel, J. A.**

Soil survey in the Connecticut valley.
U. S. Dept. Agric., Bur. Soils, Rept. Field Oper. for 1899, 125-140, 6 pls., map, 1900.

The area described in Connecticut extends from Glastonbury to the Massachusetts line, and from the eastern crystallines to the Talcott range. Tobacco soils are described in detail under the headings: Triassic stony loam; Holyoke stony loam; Windsor sand; Hartford stony loam; Podunk fine sandy loam; Connecticut meadows; Enfield sandy loam; Suffield clay; Elmwood loam; Connecticut swamp.

107. **Eaton, G. F.**

Notes on the collection of Triassic fishes at Yale.
Am. Jour. Sci., (4) xv, 259-268, 18 figs., 1903.

The following species are described: Semionotus fultus; S. micropterus; S. Marshi; S. tenuiceps; S. ovatus; Catopterus gracilis. Semionotus micropterus is known only from Connecticut.

108. **Eckel, E. C.**

Brown hematite deposits of eastern New York and western New England.

Eng. Min. Jour., lxxviii, 432-434, 6 figs., 1904.

Two mines occur in Salisbury. The Davis mine from top to bottom shows limonite and clay 15-20 ft.; ocher 20-40 ft.; lenses of manganese ore; "black ocher" 1-5 ft. The ore contains manganese and slight amount of phosphorus, and was originally deposited as limonite. The Ore Hill mine consists of a large body of disintegrated ore mixed with clay. The iron content runs from 35% to 50%. Manganese and iron carbonate, also phosphorus, occur. The ore originated as replacement of limestone by iron carbonate.

109. **Eggleston, J. W.**

Some glacial remains near Woodstock, Connecticut.

Am. Jour. Sci., (4) xiii, 403-408, 1902.

Description of kames, eskers, kettle-holes, and terraces of an old lake bed of which Woodstock pond is the remnant.

110. **Emerson, B. K.**

The age and cause of the gorges cut through the trap ridges by the Connecticut and its tributaries.

Am. Assoc. Adv. Sci., Proc., xxxv, 232, 1886.

"The gorges were cut by the pre-Glacial drainage, and the streams were restored to their old course by the position of their deltas."

111. **Emerson, B. K.**

Diabase, pitchstone, and mud inclosures of the Triassic trap of New England.

Geol. Soc. America, Bull., viii, 59-86, 7 pls., 1897.

The Meriden "Ash Bed" is described in detail, including the petrography and chemistry of the pitchstone, glass and sand. The origin of the glasses and minerals is discussed, and an analysis of the basic pitchstone given.

112. **Emerson, B. K.**

Holyoke Folio, Massachusetts-Connecticut.

U. S. Geol. Surv., Geol. Atlas U. S., Folio No. 50, 1898.

Topography, general and economic geology of a strip about 2½ miles wide along the north edge of Connecticut between the meridians 73° and 72° 30′. Describes the following formations: Washington gneiss; Becket gneiss; Hoosac schist; Chester amphibolite; Sugarloaf arkose; Longmeadow sandstone; Holyoke diabase; Chicopee shale; and Glacial deposits.

113. **Emerson, B. K.**

Geology of eastern Berkshire county, Massachusetts.

U. S. Geol. Surv., Bull. No. 159, 135 pp., 9 pls., 16 figs., maps, 1899.

Geology of parts of the towns of Norfolk, Colebrook, North Canaan, and Hartland. In the North Canaan-West Norfolk area are

found: Hinsdale limestone and Washington gneiss, pre-Cambrian; hornblende schist, Becket conglomerate gneiss, Cambrian; Stockbridge limestone, Silurian. Analyses of nodule from gneiss and of pre-Cambrian limestone. Bibliography.

114. **Emerson, B. K.**

Note on corundum and a graphitic essonite from Barkhamsted, Connecticut.

Am. Jour. Sci., (4) xiv, 234-236, 1902.

Description of the corundum and a graphitic garnet rock occurring in a coarse mica schist.

115. **Emmons, E.**

Agriculture of New York, comprising an account of the classification, composition, and distribution of the soils and rocks and natural waters of the different geological formations, together with a condensed view of the climate and agricultural productions of the State.

I, 371 pp., 21 pls., 4°, Albany, 1846. (Has a good map.) Chapter on "the Taconic system" issued separately, 67 pp., 6 pls., 4°, Albany, 1844.

Stockbridge limestone and accompanying schists are described and stated to rest on Taconic slates.

(The Taconic system of Emmons along western New England and eastern New York corresponds to the Cambrian and Ordovician systems combined. Emmons believed the Taconic to be an independent system because it rests unconformably upon Primary schists and passes unconformably beneath the New York system.— *Ed.*)

(See Dana, 48, 59, 61, 65; Walcott, 286, 287.)

116. **Fippin, E. O.**

Soil survey of the Connecticut valley.

U. S. Dept. Agric., Bur. Soils, Rept. Field Oper. for 1903, 31-61, map, 1904.

The work done in 1899 was extended by the survey of 260 square miles in Massachusetts and Connecticut. The work of the two years resulted in a survey of that part of the Connecticut Triassic between Berlin and the Massachusetts line. The types of soil represented are Holyoke stony loam; Triassic stony loam; Hartford sandy loam; Connecticut meadows; Windsor sand; Chicopee gravel loam; Enfield sandy loam; Manchester sandy loam; Connecticut swamp; Norfolk coarse sandy loam; Suffield clay; Elmwood loam; Podunk fine sandy loam; Bernardston loam.

117. **Frazer, P., Jr.**

Description of microscopic sections of traps.

Am. Phil. Soc., Proc., xiv, 430, 431, 1876.

Comparison of traps from Pennsylvania and Connecticut. The fine-grained, greenish dolerites were exactly alike in both localities; coarse-grained gray rock, which in fragments seemed identical, under the microscope showed differences, the specimen from Connecticut being coarse-grained dolerite, while that from Pennsylvania was true syenite.

118. **Frazer, P., Jr.**

[Review of] "On the physical history of the Triassic formation in New Jersey and in the Connecticut valley," by I. C. Russell.

Am. Nat., xiii, 289-292, 1879.

Criticism of Russell's views regarding the Triassic formation. (See Russell, 249.)

119. **Fuller, M. L.**

Triassic rocks of the Connecticut valley as a source of water-supply.

U. S. Geol. Surv., Water-Supp. and Irr. Paper No. 110, 95-812, 8 figs., 1905.

Occurrence of waters in Triassic rocks of various types: influence of jointing and faulting on the underground waters; conditions favorable to flowing wells; water is in most instances highly mineralized, but rarely subject to pollution. Proper depth of wells.

120. **Gannett, H.**

A geographic dictionary of Connecticut.

U. S. Geol. Surv., Bull. No. 117, 67 pp., 1894.

All the names of towns, rivers, etc., given on the topographic atlas of 1893 are listed and briefly described; the area of each county is given.

121. **Gannett, H.**

Magnetic declination in the United States.

U. S. Geol. Surv., 17th Ann. Rept. for 1895-96, pt. 1, 211-428, 1896.

(See also, U. S. Coast and Geod. Surv., Rept. for 1888.)

Data for determination of secular variation based on observations at Hartford from 1810 to 1879, at New Haven from 1811 to 1885, and in less degree at other stations. The west declination of the needle in 1900 for places in Connecticut is as follows: Stamford 9° 45′; Norwalk 10° 10′; Black Rock 10° 10′; Bridgeport 9° 40′; Hartford 9° 20′; Saybrook 10° 10′; Middletown 10° 10′; Milford 9° 55′; New Haven 9° 35′; Hebron 9° 10′; Pomfret 11° 00′; Putnam 11° 10′.

122. **Gibb, G. E.**

Crystallized bodies discovered in meteoric stone.

Am. Min. Jour., i, 190, 1814.

Pyrite crystals found in Weston meteorite; prove rock not formed in the air. (See Silliman and Kingsley, 261.)

123. **Gregory, H. E.**

Connecticut. (Well and spring records.)

U. S. Geol. Surv., Water-Supp. and Irr. Paper No. 102, 127-159, 1904.

Considers briefly the underground water conditions (127) and gives tables and notes relating to wells (128-149) and springs (149-159.) The

well data include source, temperature, yield, quality (including analyses), and uses; the spring data, temperature, yield, source, use, improvements, and quality (including analyses).

124. **Gregory, H. E.**

Underground waters of eastern United States: Connecticut.

U. S. Geol. Surv., Water-Supp. and Irr. Paper No. 114, 76-81, map, 1905.

The water supply as related to the geology of the state. The limestone area, sandstone area, crystalline area, faults, drift, are the subheads.

124a. **Gregory, H. E.**

The Geology of Connecticut as related to water supply.

Connecticut Board Agric., Rept., 283-297, 1906.

Description of the sources of water supply — rivers, lakes, ground water.

124b. **Gregory, H. E., and Rice, W. N.**

Manual of Connecticut geology.

Connecticut State Geol. Nat. Hist. Surv., Bull. No. 6. 259 pp., 31 pls., 22 figs. (10 maps), 1906.

(See Rice and Gregory, 243a.)

124c. **Gregory, H. E., and Robinson, H. H.**

Preliminary geological map of Connecticut.

Connecticut State Geol. Nat. Hist. Surv., Bull. No. 7. 39 pp., 1 fig., 1907, together with a geological map of Connecticut, 1906.

A description of the geological map, also an outline of the geology of the state, history of the Connecticut surveys, and an outline of geological work done in the state by various organizations and individuals.

125. **Griswold, L. S.**

A basic dike in the Connecticut Triassic.

Mus. Comp. Zoöl., Bull. xvi, 239-242, 1893.

Description (chiefly petrographic) of a dike occurring on the outlet of Beseck lake, about a quarter of a mile west of the Air Line R.R. at Baileyville; the rock probably an augite-amphibole-fourchite.

126. **Gurlt, A.**

On a remarkable deposit of wolfram ore in the United States.

Am. Inst. Min. Eng., Trans., xxii, 236-242, 1893.

Description of the wolfram ores and their geological occurrences. The Connecticut ores, consisting of wolframite, scheelite, and wolfram ochre, occur upon a "so-called contact deposit" imbedded between crystalline limestone and gneiss in Trumbull. The wolframite crystals are pseudomorphs after scheelite. Brief history of the workings of the mine is given. (See Hobbs, 156.)

127. **Hall, J.**

Paleontology of New York, volume 3, containing descriptions and figures of the organic remains of the Lower Helderberg group and the Oriskany sandstone, 1855-59 (with volume of 120 plates), xii, 523 pp., 4°, Albany, 1859.

The introduction to this volume (1-96) includes a general discussion of the conditions of deposition and of mountain-making, with mention of formations occurring in Connecticut.

128. **Hawes, G. W.**

The trap rocks of the Connecticut valley.
Am. Jour. Sci., (3) ix, 185-192, 1875.

Demonstration, by chemical analyses, of the common source of the hydrous and anhydrous varieties of trap rock.

129. **Hawes, G. W.**

The rocks of the "chloritic formation" on the western border of the New Haven region.
Am. Jour. Sci., (3) xi, 122-126, 1876.

Proof, by chemical analysis, of the similarity between the metamorphic schists and trap rocks of the New Haven region.

130. **Hawes, G. W.**

On the mineralogical composition of the normal Mesozoic diabase upon the Atlantic border.
U. S. Nat. Mus., Proc., iv, 129-134, 1881.

Chemical analyses of these rocks show that the unaltered Mesozoic diabases are all very much alike, and are composed of augite, iron oxide, in the form of magnetic and titanic iron, and a feldspar that has been shown to be labradorite: the Triassic diabases are monotonously like those in the older formations. (See Dana, 50.)

131. **Hitchcock, C. H.**

On the so-called talcose schist of Vermont.
Am. Assoc. Adv. Sci., Proc., xiii, 321-329, 1860.

Description, both chemical and geological, of so-called talcose schist of Vermont; name a misnomer; comparatively little magnesia. Brief mention of the Connecticut schist as an extension of the Vermont area.

132. **Hitchcock, C. H.**

The relations of the geology of New Hampshire to that of the adjacent territory.
Geol. of New Hampshire, ii, 3-36, 1 pl., Concord, 1877.

Reference to the formations of the Connecticut valley, including the sandstone of Connecticut.

133. **Hitchcock, C. H.**

Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut, geological formations.

Macfarlane's Am. Geol. R. R. Guide, 56-66, 1879; 2d ed., rev. and enl., 1890.

List of stations on Connecticut railroads given, with character and age of rock to be seen at each place. An attempt is made to correlate the rock groups of Percival with those of other localities, thus introducing the terms Laurentian, Montalban, etc., into Connecticut geology.

134. **Hitchcock, C. H.**

North America in the ice period.

Pop. Sci. Mon., xx, 229-242, 1882.

There was an eastern American area of ice which included Connecticut, and whose center was in Labrador. Old channels of the Hudson and Connecticut rivers indicate an oscillation of level.

135. **Hitchcock, C. H.**

Geological map of United States and part of Canada.

Am. Inst. Min. Eng., Trans., xv, 465-488, map, 1886.

Discussion and description of the scheme of coloration and nomenclature, recommended by the International Geological Congress, for representing the various geological formations on a map; review of earlier maps of Maclure, Hall, Lyell, E. Hitchcock, Marcou, H. D. Rogers, Hall and Lesley, Hall and Logan, C. H. Hitchcock and Blake, C. H. Hitchcock and McGee. Brief mention of geological formations in Connecticut.

136. **Hitchcock, E.**

A sketch of the geology, mineralogy, and scenery of the regions contiguous to the river Connecticut; with a geological map and drawings of organic remains; and occasional botanical notices.

Am. Jour. Sci., (1) vi., 1-86, 201-236, map, 1823; vii, 1-30, map, 1824.

In these articles are described the "East Haven granite"; granitic veins "contemporaneous with the formation of the rock"; porphyritic granite; hornblende slate, mica slate, as in Bolton, Litchfield, etc.; chlorite slate in Milford; Primitive greenstone in West Haven and Wolcott; verd-antique in Milford; Old Red sandstone, including large areas of "Coal formation" and containing fossil bones; Secondary greenstone, its structure, composition and distribution. The "greenstone" forms beds in the peculiar rocks of the Coal formation, and both greenstones and Coal formation rest on Old Red sandstone; talus proves recent creation of earth; greenstone probably of igneous origin; coal occurs in Middletown, Chatham, Southington, Berlin, Somers, Ellington, Enfield; is in very thin seams; fish remains obtained at Westfield, and plants from Granby; alluvion; geest, the bowlders of which were deposited by a current from the northeast. Eleven mines are described, also 119 mineral and rock species. Lakes formerly existed in the Connecticut valley. Table given showing relative age of all rocks.

137. **Hitchcock, E.**

Miscellaneous notices of mineral localities, with geological remarks.

Am. Jour. Sci., (1) xiv, 215-230, 1828.

Native iron, augite, and tremolite at Canaan; iron ore at Salisbury; prehnite, greenstone, sandstone, and shale at Woodbury; petrified tree stump at Southbury. In the vicinity of Lane's mine at Monroe were found wolfram, topaz, carbonate of iron, hornblende, smoky and yellow quartz, green feldspar, brown spar, associated with tripoli, black schorl, chlorophane.

138. **Hitchcock, E.**

Report on the geology of Massachusetts, Pt. 1. Economic geology.

Am. Jour. Sci., (1) xxii, 1-70, map, 1832.

Describes the location and character of the following formations in Connecticut: mica-slate, argillaceous and flinty slate, limestone, scapolite rocks, gneiss, hornblende slate, granite, New Red sandstone, greenstone, talcose slate; states their value as building stones and soil-formers. Mentions iron ore at Salisbury, copper near Granby; soap-stone near Somers; also porcelain clay. Gives opinion that the so-called coal formation of Connecticut is the New Red sandstone or its equivalent.

139. **Hitchcock, E.**

Ornithichnology. Description of the foot-marks of birds (ornithichnites) on New Red sandstone in Massachusetts.

Am. Jour. Sci., (1) xxix, 307-340, 2 pls., 1836. Abstract: Neues Jarhb., 467-472, 1836.

General and detailed description of bird-tracks found in sandstone in various parts of Massachusetts. Comparison of birds to modern species. Theories as to the geological age of the sandstone, as to the geographical conditions at the time when the birds were alive, and as to the manner in which the foot-marks were made and preserved.

140. **Hitchcock, E.**

Bed of the Connecticut river.

Geol. Massachusetts, Final Rept., 334, 1841.

Describes flow and fall of the Connecticut River.

141. **Hitchcock, E.**

The phenomena of drift, or glacio-aqueous action in North America, between the Tertiary and Alluvial periods.

Assoc. Am. Geol., Trans., 164-221, 1843.

Discussion of the origin of drift: "Phenomena of drift are the result of the joint and alternate action of ice and water." Some of the data taken from observations in Connecticut.

(The author at this early date accepted a great deal of the glacial theory as known at the present day.— *Ed.*)

142. **Hitchcock, E.**

Description of several species of fossil plants from the New Red sandstone formation of Connecticut and Massachusetts.

Assoc. Am. Geol., Trans., 294-296, 1 pl., 1843.

Description of Coniferæ found at Woodbury and Southbury.

143. Hitchcock, E.

On the trap tuff, or volcanic grit of the Connecticut valley, with the bearings of its history upon the age of the trap rock and sandstone generally in that valley.

Am. Jour. Sci., (2) iv, 199-207, 2 figs., 1847. Abstract: Am. Jour. Sci., (1) xlvii, 103, 104, 1844.

Tuff near Mount Tom described in detail. Order of events: Deposition of sandstone; bedded traps produced at intervals; "principal trap ranges emerged with considerable disturbance of sandstone." General dip of sandstone due to lateral pressure.

144. Hitchcock, E.

An attempt to discriminate and describe the animals that made the fossil foot-prints of the United States, and especially of New England.

Am. Acad. Arts Sci., Mem., iii, 129-256, 24 pls., 1848.

Forty-seven species of animals described from their foot-prints have been found in the Connecticut valley, in Massachusetts and Connecticut, classified as follows: 12 quadrupeds; 2 annelids or molluscs; 3 of doubtful origin; 32 bipeds, mostly birds. The Connecticut localities where the remains were found are Suffield, Rocky Hill, Wethersfield cove, 2 miles south of the cove, Portland, 2 miles west of Middletown.

145. Hitchcock, E.

Illustrations of surface geology.

Smithson. Contr. Knowl., ix, art. iii, 155, 12 pls., 1857.

Detailed description of the terraces and beaches, particularly of the Connecticut valley; they were formed during a period of submergence of the continent when the ocean stood relatively 2,000 feet higher than its present level; drift (unmodified deposits) produced partially by glaciers, mostly by icebergs, possibly by mountain slides and earthquake waves.

146. Hitchcock, E.

Ichnology of New England; a report on the sandstones of the Connecticut valley, especially its fossil foot-marks. xii, 220 pp., 50 pls., including hand-colored map. Boston, 1858, published by the Commonwealth of Massachusetts.

Abstract and review: Am. Jour. Sci., (2) xxvii, 270-272, 1859.

First foot-prints found in South Hadley, 1802, spoken of as tracks of "Noah's Raven"; in 1836 tracks observed on flagging stone from Montague, and sent to Hitchcock by Deane as "foot-prints of birds." Connecticut valley sandstones above and below the traps are of different ages, the upper being Jurassic, the lower may be Triassic and Permian. Trap was deposited on sandstone. Connecticut localities from which foot-prints were obtained are Suffield, Rocky Hill, Wethersfield, Portland, Middletown, Middlefield, Durham. The question of the discovery of foot-prints is discussed, and a bibliography of 63 titles is given.

(See Deane, 101.)

147. **Hitchcock, E.**

Supplement to the ichnology of New England.

93 pp., 20 pls., edited by C. H. Hitchcock, published by Commonwealth of Massachusetts, 1865.

In this report 37 new species are described, and a catalogue is given of the specimens in the Hitchcock Ichnological Cabinet at Amherst.

148 **Hitchcock, Edward.**

Biography.

C. H. Hitchcock: Am. Geol., xvi, 133-149, 1895.

Lesley: Nat. Acad. Sci., Biog. Mem., i, 115-134, 1877.

Pop. Sci. Mon., xlvii, 689-696, 1895.

149. **Hobbs, W. H.**

Notes on some pseudomorphs from the Taconic region.

Am. Geol., x, 44-48, 1892.

Description of tremolite pseudomorphs after salite, also pseudomorphs after feldspar, found in the northwestern part of Connecticut, mainly in Canaan and Norfolk townships.

150. **Hobbs, W. H.**

On the geological structure of the Mount Washington mass of the Taconic range.

Jour. Geol., i, 717-736, 4 figs., 2 pls., map and sections, 1893.

Evidence that schist of this vicinity is below limestone, and structure of mountain is essentially anticlinal. Schist of northern extremity is above limestone; calcareous beds alternate with the schists, which have been shown to possess marked lithological differences; probability of the beds being Ordovician, although a portion may be Cambrian. The Mount Washington series consists of four members, in order of age as follows: 1. Canaan dolomite; 2. Riga schist; 3. Egremont limestone; 4. Everett schist. Striking lithological distinctions separate the two schist horizons.

151. **Hobbs, W. H.**

The geological structure of the Housatonic valley lying east of Mount Washington.

Jour. Geol., i, 780-802, 9 figs., 3 pls., map (pl. v), 1893.

District contains same horizons as Mount Washington. Ridges are anticlinals of Riga schist produced by north-south compression. Area marked by unsymmetrical folds. A reversed fault (Housatonic fault) has complicated the stratigraphy, and resulted in production of metamorphic minerals.

152. **Hobbs, W. H.**

Differential faults.

Am. Geol., xiv, 35-37, 1894.

Discussion of a new type of fault—"differential fold fault,"—and description of one at the Housatonic river in Canaan.

153. **Hobbs, W. H.**

Mineralogical notes.

Am. Jour. Sci., (3) i, 121-128, 1895.

Description of apatite and hessonite from a pegmatite vein in Canaan.

154. **Hobbs, W. H.**

The river system of Connecticut.

Jour. Geol., ix, 469-485, 2 figs., 2 maps (pls. i, ii), 1901.

The rivers of Connecticut exhibit an orientation which corresponds closely with the directions of a fault series observed in the Pomperaug valley; the "trough lines" of streams are believed to owe their existence to faults.

155. **Hobbs, W. H.**

The Newark system of the Pomperaug valley.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, 7-160, 59 figs., 27 pls., 1901.

The Newark system of the Atlantic slope in the light of recent studies; previous work on the Newark rocks of the Pomperaug valley; areal distribution of the Newark in the Pomperaug valley, and discussion of its relation to the basement floor of crystalline rocks; petrographic and chemical description of type specimens of the region. Discussion of the elevation and tilting of the Newark beds; also of the elaborate fault system of the region,— main direction of fault lines, their expression in topographic forms, their origin, comparison with other regions, fault lines, and drainage. Discussion of the steps in the degradation and erosion of the region.

(This paper deals with the Pomperaug area of Newark rocks after the manner of treatment of the Connecticut valley area by Davis. This paper and the one by Davis (98), contain all the important facts regarding the Connecticut Triassic.— *Ed.*)

156. **Hobbs, W. H.**

The old tungsten mine at Trumbull, Connecticut.

U. S. Geol. Surv., 22d Ann. Rept., pt. ii, 7-22, 1 fig., 5 pls., 1901.

The tungsten minerals, wolframite and scheelite, are found at the contact between a crystalline limestone and hornblende gneiss; the formation of wolframite after scheelite is noticed, and the crystallographic description of the two minerals is given. The associated minerals are mica, pyrite, pyroxene, scapolite, garnet, marcasite, limonite, topaz, fluor-spar, margarodite, quartz, feldspar, apatite, sphene, ilmenite, calcite, zoisite, epidote, hornblende, chalcopyrite, malachite. The first workings of the mine were for copper, lead, and silver.

(See Gurlt, 126; Hobbs, 159.)

157. **Hobbs, W. H.**

Still rivers of western Connecticut.

Geol. Soc. America, Bull., xiii, 17-26, 3 figs., 2 pls., 1901.

The Still river tributary to the Farmington, and that to the Housatonic, owe their origin partly to geological structure of the region, and partly to a damming of the valley by Glacial drift.

158. Hobbs, W. H.

An instance of the action of the ice sheet upon slender projecting rock masses.

Am. Jour. Sci., (4) xiv, 399-403, 2 figs., 1 pl., 1902.

Data proving that the former peaks of Sherman hill and Castle rock, in the Pomperaug valley, were removed by glacier ice.

159. Hobbs, W. H.

Tungsten mining at Trumbull Connecticut.

U. S. Geol. Surv., Bull. No. 213, 98, 1903.

Tungsten deposit worked from 1898 to 1901; yield of ore 5%. (See Hobbs, 156.)

160. Hobbs, W. H.

Tectonic geography of southwestern New England and southeastern New York.

Geol. Soc. America, Bull., xv, 554-557; Science, xix, 527; Scient. Am., Supp., lvii, 23446, 1904.

The study of certain key areas, among them Twin lakes valley and Pomperaug valley, have demonstrated the prevalence of normal fault structures and their importance in the crustal architecture of the region described. Joints and earth lineaments are found to take the same directions. The facts discovered in the "key areas" are of wider application.

161. Hobbs, W. H.

Lineaments of the Atlantic border region.

Geol. Soc. America, Bull., xv, 483-506, 4 figs., 3 pls., 1904.

The direction of dominant lineaments (or rectilinear earth features), usually due to faults or joints, is determined for the region between St. Lawrence bay and Georgia. Connecticut is traversed by the Connecticut and Franconia lines N 5° E, by the northern fall line N 48° E, and by the Rias coast line, N 65° E.

162. Hovey, E. O.

Observations on some of the trap ridges of East Haven — Branford region.

Am. Jour. Sci., (3) xxxviii, 361-383, 1 pl., 1889. Abstract: Am. Assoc. Adv. Sci., Proc., xxxviii, 232, 233, 1890; Am. Nat., xxiv, 110, 1890.

Description of Pond rock (Saltonstall ridge), Totoket mountain, and the neighboring ridges of trap; their general geological relations to the sandstone and to each other; conclusions as to origin; Pond rock considered intrusive.

163. Hovey, E. O.

A relatively acid dike in the Connecticut Triassic area.

Am. Jour. Sci., (4) iii, 287-292, 3 figs., 1897.

Petrographic and chemical description of a series of dikes in a railroad cut in Fair Haven. The analysis of one dike shows it to be approximately a bostonite.

164. **Hubbard, O. P.**

Great bowlder in Woodbridge, Connecticut.
New York Acad. Sci., Trans., iv, 25, 1887.

Mention of a great basaltic bowlder (45x25x15 feet) which lies on a ridge of talcose and chlorite slate, 5 miles west of New Haven. It was brought from the Meriden hills by a glacier. (Dana.)

165. **Hulbert, E. M.**

Copper mining in Connecticut.
Connecticut Quart., iii, 23-32, 8 illus., 1897.

The various localities where copper has been found within the state are described, and an account given of their discovery and history. Data are particularly complete regarding the mines of Whigville (now Edgewood) near Bristol.

166. **Hunt, T. S.**

On some of the crystalline limestones of North America.
Am. Jour. Sci., (2) xviii, 193-200, 1854.

Description of four classes of limestone, their geological position and relation to other formations, and included minerals. The limestone of western Connecticut is described.

167. **Hunt, T. S.**

On the geognosy of the Appalachian system.
Am. Nat., v, 451-486, 1871; Am. Assoc. Adv. Sci., Proc., xx, 1-35, 1871.

Age and geological relations of the crystalline stratified rocks of North America. Separation of crystalline strata of northern New York and New England into three groups: 1. The Adirondack or Laurentide series; 2. The Green mountain series; 3. The White mountain series. Their distinctive characteristics; tracing of the groups southward; geological relations; position in time scale. Discussion of the "Taconic system." The graphitic mica schists holding garnets and cyanite, in Cornwall, Connecticut, belong to group 2; other schists and gneisses of Connecticut are mentioned as belonging to one or more of the three groups.

168. **Hunt, T. S.**

Address to the American Association for the Advancement of Science [abstract and review of] (Hunt, 167).
Am. Jour. Sci., (3) ii, 205-207, 1871.

An address on the geology of the Appalachians, and the origin of the crystalline rocks. Mentions especially the rocks of New England.

("The conclusions throughout Dr. Hunt's address are open to doubts and objections."— *Am. Jour. Sci.*)

169. **Hunt, T. S.**

Remarks on the stratification of rock masses.
Boston Soc. Nat. Hist., Proc., xvi, 237-239, 1874.

The stratiform structure in erupted rocks due to the arrangement of the elements in a flowing and imperfectly liquid material; well shown in a specimen from Groton, Connecticut, in which a large angular fragment of strongly banded micaceous gneiss is inclosed in a fine-grained eruptive granite.

170. **Hunt, T. S.**

Special report on the trap dikes and Azoic rocks of southern Pennsylvania. Pt. I. Historical introduction.

Geol. Surv. Pennsylvania (2), Rept. E, xxix, 253 pp., Harrisburg, 1878.

The state geologist of Pennsylvania asked Mr. Hunt to "collate all the known, supposed, and suspected facts of American Azoic Geology." The result is a history of pre-Silurian geology, and an attempt to reconcile divergent views. Various views regarding the Taconic rocks, Stockbridge limestone, etc., of western Connecticut are discussed without arriving at definite conclusions.

171. **Hunt, T. S.**

Geology.

Smithson. Rept., 325-345, 1882.

Review of the progress of geology for 1882. Mention of the Connecticut Triassic as described by Davis — sandstones and shales, trap rocks (dikes, intruded sheets, extrusive flows).

172. **Hunt, Thomas Sterry.** (1826-1892.)

Biography.

Frazer: Am. Geol., xi, 1-13, 1893.

Can. Rec. Sci., v, 145-149, 1892-3.

173. **Jackson, C. T.**

Observations on the age of the sandstone of the United States.

Boston Soc. Nat. Hist., Proc., iii, 335-336, 338-339, 1850.

Mention of the similarity of the sandstones of Nova Scotia, Maine, Massachusetts, Connecticut, and New Jersey. Notice that the trap comes up as beds rather than dikes, always between the strata of sandstone, never through them; amygdaloidal character noticed; the sandstone is referred to the Silurian, and is held to be related to the Lake Superior sandstone.

174. **Johnston, J.**

Notice of some spontaneous movements observed in the sandstone strata in one of the quarries at Portland, Connecticut.

Am. Assoc. Adv. Sci., Proc., viii, 283-286, 1855.

Description of special cases where the sandstone strata moved suddenly about ¾ of an inch on being partially cut through in quarrying; movement takes place only in the general direction of north and south.

(See Niles, 225.)

175. **Julien, A. A.**

On the geological action of the humus acids.

Am. Assoc. Adv. Sci., Proc., xxviii, 311-410, map, 1880.

Discussion of the decomposition taking place in rocks, including the Triassic sandstones of Connecticut, and the source of the iron oxide.

176. **Kemp, J. F.**

The great quartz vein of Lantern hill, Mystic, Connecticut, and its decomposition.

New York Acad. Sci., Trans., xv, 189, 1896.

Vein 400 feet wide, 1,200 feet long; composed almost entirely of hard, milky white quartz, which, however, is very crumbly, due to effects of faulting or crushing rather than to corroding alkaline solution. The rock contains 98-99.4% SiO.

(For a different explanation of Lantern hill, see Rice and Gregory, 243a.— Ed.)

177. **Kemp, J. F.**

Granites of southern Rhode Island and Connecticut.

Geol. Soc. America, Bull., x, 361-682, 7 pls., 1899. Abstract: Am. Geol., xxiii, 105-106, 1899; Science, ix, 140-141, 1899.

Occurrence and petrography of granites along the shore from Rhode Island to New Haven, particularly at Westerly and Stony Creek. Granites are intrusives of post-Cambrian age; pegmatites and aplites are described. Analyses of granite from Westerly, Millstone point, Stony Creek.

178. **Killebrew, J. B.**

Report on the culture and curing of tobacco in the United States.

Census of U. S., 10th Rept., iii, 583-950, 1883.

The soil of the Connecticut and Housatonic valleys is suitable for tobacco. Terraces of the Champlain period and flood-plain deposits are best adapted. Character of soil derived from porphyry, micaceous rocks, granite, chlorite slate, sandstone, and trap is discussed.

179. **Kimball, H. H.**

Ice caves and frozen wells as meteorological phenomena.

Mon. Weath. Rev., 366-371, August, 1901.

Ice deposits found in summer in ravines and gorges at Meriden, Northfield, and Salisbury.

180. **Knowlton, F. H.**

Report on fossil wood from the Newark formation of South Britain, Connecticut.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, 161-162, 1901.

Microscopical description of more or less silicified wood, of the species Araucarioxylon virginianum Knowlton, found in the Newark formations of South Britain. The Connecticut material is identical with species from Virginia and North Carolina.

181. **Koons, B. F.**

High terraces of the rivers of eastern Connecticut.
Am. Jour. Sci., (3) xxiv, 425-428, 1882.

Positions of former ice dams as indicated by the terraces on the Thames, Shetucket, Natchaug, Hope, and Willimantic rivers.

182. **Koons, B. F.**

On pot-holes on the edge of a bluff at Gurleyville, Connecticut.
Am. Jour. Sci., (3) xxv, 471, 1883.

Brief description of pot-holes on the east side of the Fenton river, four miles above its mouth.

183. **Kümmel, H. B.**

Some rivers of Connecticut.
Jour. Geol., i, 371-393, 4 figs., 1893.

Connecticut streams have all been greatly readjusted. The Housatonic has been "conformably superimposed." The lower Connecticut is a revived consequent stream. The former course of the Farmington was southward to New Haven; the Scantic and Quinnipiac have been much modified.

184. **La Métherie, J. C. de.**

Abstract of Silliman's mineralogical and geological observations on New Haven and its vicinity.
Jour. Phys. Chim., lxxv, 75-79, 1812.
(See Silliman, 260.)

185. **Lee, C. A.**

Sketch of the geology and mineralogy of Salisbury, Connecticut.
Am. Jour. Sci., (1) viii, 252-261, 1824.

The geology, mineralogy, and natural scenery of Salisbury are described. The principal rocks are mica slate, fissile and injected with quartz, forming the highest points, and granular limestone. A chasm or cave in the compact mica slate is 300x60x40 feet. The alluvial deposits contain iron ore, tree trunks, and Indian skeletons. The following minerals are reported: calcium carbonate, calcium sinter, calcium tufa, magnesium, carbonate of lime, dolomite, sulphate of alumina, 9 varieties of quartz, fetid carbonate of lime, silicious sinter, hornstone, jasper, staurotide, mica, schorl, tourmaline, feldspar, beryl, wacke, scapolite, garnet, epidote, tremolite, augite, hornblende, actinolite, talc, chlorite, argillaceous slate, potter's clay, sulphur, petroleum, graphite, 9 varieties of iron, galena, zinc, manganese, titanium.

186. **Lee, C. A.**

The moving rocks of Salisbury.
Am. Jour. Sci., (1) ix, 239-241, 1825.

Bowlders in Northeast and Little ponds are being moved shorewards by the ice; one rock moved 2¼ feet from December, 1823, to February, 1825, which is less than the usual rate. (See Petros, 232.)

187. **Lindsley, H. W.**

Building stones and the quarry industry.
Census of U. S., 10th Rept., x, 126-129, 1880.

A short description is given of the Connecticut quarries and quarry regions. The brown and red sandstone quarries at Portland and elsewhere in the Connecticut valley, granite, syenite, serpentine, and verd-antique marble, are included.

188. **Loomis, I. F.**

The town of Chatham.
Connecticut Quart., v, 375-377, 1899.

The old cobalt mine opened at Great Hill in 1762, by John Stephanney; worked again in 1770, when ore was shipped to England, Holland, and China. Mine operated by Seth Hunt, 1818-1820; by C. U. Shepard, 1844; Edmund Brown, 1850. Ore is arsenical pyrites, containing 80% arsenic, 9% iron, 4½% sulphur, 4% cobalt, and a trace of bismuth.

189. **Loper, S. W.**

Fossils of the anterior and posterior shales.
Geol. Soc. America, Bull., ii, 425-430, 1891.

Comparison of fauna and flora from different localities of the anterior and posterior shales sustains the theory of the original continuity of the horizons through all the now faulted blocks of the Triassic formation. Localities explored are as follows: Durham, Bluff Head, Higby, Berlin, Southington, East Haven, North Guilford, Stevens, Westfield, South Bloomfield, North Bloomfield. Species found, as follows: *Fishes,*— Diplurus longicaudatus, Newb.; Catopterus redfieldi, Egerton; Catopterus gracilis, J. H. Redfield; Ischypterus micropterus, Newb.; Ptycholepis marshii, Newb.; Catopterus anguilliformis, W. C. Redfield; Catopterus minor, Newb.; Catopterus ornatus, Newb.; Ischypterus fultus, Agassiz; Ischypterus minutus, Newb.; Ischypterus gigas, Newb. *Plants.*— Otozamites latior, Sap.; Otozamites brevifolius, F. Br.; Loperia simpexl, Newb.; Cycadinocarpus chapini, Newb.; Equisetum (?); Pachyphyllum simile, Newb.; Pachyphyllum brevifolium, Newb.; Clathropteris platyphylla, Brong.; Baiera münsteriana, Ung.; Equisetum rogersi, Sch.; Ctenophyllum braunianum, Sch. Some undetermined species both of fishes and plants.

190. **Loughlin, G. F.**

The clays and clay industries of Connecticut.
Connecticut State Geol. Nat. Hist. Surv., Bull. No. 4, 1-121, 1905.

The important clay areas of Connecticut are the northern, in the vicinity of Hartford and Windsor, Clayton, Berlin, Quinnipiac, and Milldale. The clays are discussed under the following heads: Origin; geological history; chemistry of clays; physical properties of clays; commercial classification; composition; properties; and adaptabilities. The clay industries of Connecticut are discussed under the following heads: Prospecting; manufacture of brick; manufacture of pottery; condition of the clay industry.

191. **Lowrey, T.**

Water cement of Southington, Connecticut.
Am. Jour. Sci., (1) xiii, 382-383, 1828.

Brief description of hydraulic limestone 2½ miles east of Southington; was used in the construction of the Farmington canal.

192. **Lull, R. S.**

Fossil foot-prints of the Jura-Trias of North America.
Boston Soc. Nat. Hist., Mem., v, 461-557, 34 figs., 1904.

Reviews previous work upon fossil foot-prints, describes their geological occurrence, gives a classification and systematic description of genera, species, and higher groups.

193. **Lull, R. S.**

Fossils from the Connecticut valley Triassic.
Communicated to the author.

The following species are recognized from Connecticut:

Batrachopus deweyanus E. H.=Anisopus deweyanus E. H.; B. gracilis E. H.=A. gracilis E. H.; Anchisauripus dananus (E. H.)=Brontozoum sillimanium E. H.; A. tuberosus (E. H.)=B. validum E. H.; A. exsertus (E. H.) = B. exsertum E. H.; A. minusculus (E. H.); specimen described as Plesiornis giganteus C. H. H.; Grallator cuneatus E. H.; G. cursorius E. H.; G. formosus E. H.; G. tenuis E. H.; Anomœpus curvatus E. H.; A. gracillimus C. H. H.; A. intermedius E. H.; specimens described as Plectropterna minitans E. H. and Chimæra barratti E. H.; Corvipes lacertoideus E. H.; Eubrontes divaricatus (E. H.)=Brontozoum divaricatum E. H.; E. giganteus E. H.=B. giganteum E. H.; Otozoum caudatum C. H. H.; Otozoum moodii E. H.; Argoides isodactyletus (E. H.)=Argozoum paridigitatum E. H.=? Plesiornis æqualipes E. H.; Argoides macrodactylotus (E. H.)=Argozoum disparidigitatum E. H.; Platypterna deaniana E. H.; P. delicatula (E. H.); P. tenuis E. H.; Tarsoplectrus elegans (C. H. H.)=Plectropterna elegans C. H. H.; T. lineans (E. H.)=P. lineans E. H.; T. gracilis (E. H.)=P. gracilis E. H.; Sillimanius gracilior E. H.=Ornithopus gracilior E. H.; S. tetradactylus E. H.=O. gallinaceus E. H.; Stereopoides loripes (E. H.)=Tridentipes insignis E. H.; ? Trihamus elegans E. H.; ? T. magnus E. H.; Harpedactylus sp.; Ancyropus heteroclitus E. H.; Comptichnus sp.; Cunichnoides marsupialoideus E. H.; Exocampe ornata E. H.; Isocampe strata E. H.; Palamopus rogersianus E. H. = Macropterna vulgaris E. H.; Typopus abnormis E. H.; T. gracilis E. H.; Triænopus baileyanus E. H.=T. leptodactylus E. H.; Acanthichnus cursorius E. H.; A. cursorius var. alatus E. H.; A. cursorius var. trilineans E. H.; Conopsoides larvalis E. H.; Sagittarius alternans E. H.; Unisulcus marshi E. H.; U. minutus E. H.; Bisulcus undulatus E. H.; Trisulcus laqueatus E. H.; Cochlichnus sp.; Cunicularius retrahens E. H.; C. sp.

194. **Lyell, C.**

On the fossil foot-prints of birds and impressions of raindrops in the valley of the Connecticut.
Geol. Soc. London, Proc., iii, 793-796, 1843; Am. Jour. Sci., (1) xlv, 394-397, 1843.

The red sandstone at Rocky Hill is associated with red shale, and

capped by 20 feet of greenstone; the ripple-marked and cracked shale shows drying and shrinking during deposition; there were eruptions of trap, accompanied by upheaval and partial denudation, during the deposition of the red sandstone; impressions made in the red sandstone by some animal — undoubtedly a biped — resembling those which a bird leaves; the position of the sandstone is between the Carboniferous and Cretaceous. In the neighborhood of Durham, the author collected fishes of the genera Palæoniscus and Catopterus, but no other organic remains except fossil wood.

195. **Lyman, B. S.**

Some New Red horizons.

Am. Phil. Soc., Proc., xxxiii, 192-215, 1894. Abstract: Am. Nat., xxviii, 878-879, 1894; Jour. Geol., ii, 644, 645, 1894.

Brief review of Triassic theories. Description of Pennsylvania, Virginia, Connecticut, New Jersey, and Massachusetts areas, to show that the thickness of the formation has been underestimated (in Pennsylvania should be 27,000 feet); that the trap outcrops, both in size and extent, have been overestimated; that faults are not necessary for production of the topographic forms; that the formation may prove to be as old at least as the Permian. Most of the trap supposed to be extrusive, even the Palisades. List given of all the recorded New Red fossils arranged according to horizons.

(See critical review, by G. K. G., Jour. Geol., ii, 644-645.)

196. **Maclure, W.**

Observations on the geology of the United States, etc. (explanatory of geological map).

Am. Phil. Soc., Trans., vi, 411-428, 1809.

Adopts the Wernerian system, and gives a classification embracing all the formations. Remarks the continuity of the dolomite, speaks of cobalt at Middletown, and discusses relation of rocks of eastern United States.

197. **Maclure, W.**

Observations on the geology of the United States of North America, with remarks on the probable effects that may be produced by the decomposition of the different classes of rocks on the nature and fertility of soils; applied to the different states of the Union, agreeably to the accompanying geological map.

Am. Phil. Soc., Trans., (new series) i, 1-91, 2 pls., 1818; Leonhard's Zeitsch., i, 124-138, 1818.

Description of the "Primitive," "Transition," "Secondary," and "Alluvial" formations of the United States, east of the Mississippi. Some accounts of soils resulting from the decomposition of these rocks. The crystallines of Connecticut are designated as "Primitive" and the Triassic as "Old Red sandstone."

198. **Marcou, J.**

Geological map of the United States, and the British

provinces in North America (with explanatory texts and geological sections). 92 pp., 8 pls., Boston, 1853.

Facts regarding the Paleozoic and Secondary rocks of Connecticut are based on the work of Hitchcock and Percival. The sandstone is considered the equivalent of the Keuper of the European Trias; the trap is like that in Auvergne and in Ireland. Fossils of ganoid fish, and foot-prints of birds are found. The Green Mountain system, the "meridional system," extends through Litchfield and Fairfield counties, and terminates near Bridgeport; the Allegheny system is found east of New Haven. The sandstone and traps are of the same age as the copper-bearing rocks of Lake Superior. The geological divisions used are those of M. de Verneuil, including Murchison's grouping of the Paleozoic.

199. **Marcou, J.**

Resumé explicatif d'une carte géologique des États-Unis et des provinces anglaises de l'Amérique du Nord, avec un profil géologique allant de la vallée du Mississippi aux côtes du Pacifique, et une planche de fossiles.

Soc. géol. France, Bull., (2) xii, 813-936, map, pl., 1854-55. Abstract: Petermann, Mittheil, i, 149-159, map, 1855. Reviewed and errors enumerated: Am. Jour. Sci., (2) xvii, 198-206, 1854.

Between Carboniferous and Jurassic is a series of red sandstones and shales containing few fossils; age of these deposits not Old Red sandstone as stated by some geologists, nor Oölite nor Lias as contended by James Hall. The New Red sandstone of United States divided into four series, of which Connecticut rocks are the highest. 49 species of fossil foot-prints have been described, also three ganoids. Cupriferous trap rock, contemporaneous with the sandstones, broke through fissures, lifted and metamorphosed the sandstones, and spread out in places like lava flows.

200. **Marcou, J.**

Geology of North America, with two reports on the prairies of Arkansas and Texas, the Rocky mountains of New Mexico, and the Sierra Nevada of California. 144 pp., 7 pls., 3 maps, 4°, Zurich, 1858.

Connecticut valley contains New Red sandstone; crystalline and metamorphic rocks underlie the remainder of the state. Litchfield and Fairfield are parts of the Green mountain system. "Alleghenian dislocations continue into Connecticut to the eastward of New Haven." The report contains chapters on classification of mountains, progress and discoveries of geology of North America, and bibliography of maps and memoirs.

(This report is not considered trustworthy, and was severely criticised at the time of its appearance by Hall, Whitney, Blake, Dana, and others.— *Ed.*)

201. **Markham, F. G.**

Volcanic and seismic disturbances in southern Connecticut.

Connecticut Mag., ix, 68-74, 5 figs., 1905.

Deals in a popular way with the well-known evidences of volcanic activity in the New Haven and Meriden regions, and with the "Moodus noises," which the author ascribes to explosions of steam.

202. **Marsh, O. C.**

Notice of new American Dinosauria.

Am. Jour. Sci., (3) xxxvii, 331-336, 5 figs., 1889.

Description of Anchisaurus major, sp. nov., a small carnivorous dinosaur found near Manchester, in 1884.

203. **Marsh, O. C.**

Notice of new vertebrate fossils.

Am. Jour. Sci., (3) xlii, 265-269, 1891.

Announces discovery and gives description of Ammosaurus, gen. nov., and Anchisaurus colurus, sp. nov., from Manchester.

204. **Marsh, O. C.**

Notes on Triassic Dinosauria.

Am. Jour. Sci., (3) xliii, 543-546, 3 pls., 1892.

Description of parts of Anchisaurus solus and A. colurus, and a discussion of their affinities.

205. **Marsh, O. C.**

Restoration of Anchisaurus.

Am. Jour. Sci., (3) xlv, 169-170, 1 pl., 1893.

The skeleton of the dinosaur found at Manchester was sufficiently complete to permit of restoration, and shows a slender, delicate dinosaur, which left foot-prints like the so-called "bird-tracks." No tracks of true birds are known in this horizon.

206. **Marsh, O. C.**

The Dinosaurs of North America.

U. S. Geol. Surv., 16th Ann. Rept., pt. i, 135-244, 65 pls., 66 figs., 1896.

Describes Anchisaurus colurus, Anchisaurus solus, Ammosaurus major, from Manchester. Ammosaurus major was previously described as Anchisaurus major.

207. **Marsh, O. C.**

A new belodont reptile (Stegomus) from the Connecticut river sandstone.

Am. Jour. Sci., (4) ii, 59-62, 3 figs., 1 pl., 1896.

Announces discovery of, and describes remains of, Stegomus arcuatus from New Haven.

208. **Marsh, Othniel Charles (1831-1899).**

Biography.

Beecher: Am. Geol., xxiv, 135-137, 1899.

Beecher: Am Jour. Sci., (4) vii, 403-428, 1899.

Bidwell: Eclectic Mag., 501, 502, 1878.

Grinnell: Pop. Sci. Mon., 612-617, 1878.

Woodward: Geol. Mag., (new ser.) vi, 237-240, 1899.

209. **Mather, W. W.**

Illustrations of a section through a part of Connecticut, from Killingly to Haddam on the Connecticut river.

Am. Jour. Sci., (1) xxi, 94-97, 1832.

Description and general relations of the following: granular feldspar rock and its passage into kaolin; granular quartz rock; gneiss in thick strata; contorted gneiss; gneiss traversed with veins of granite; mica slate; syenitic and hornblende rocks.

210. **Mather, W. W.**

A geological map of New London and Windham counties.

Am. Jour. Sci., (1) xxiii, 404, 1833.

Notice of map based on geological data of Mather to be published by William Lester, Jr.

211. **Mather, W. W.**

Sketch of the geology and mineralogy of New London and Windham counties in Connecticut. 36 pp., map, Norwich, 1834.

A detailed study of the geology of New London and Windham counties. The formations recognized are: 1. Gneiss; 2. hornblende slate; 3. mica slate; 4. granular feldspar; 5. granular quartz; 6. sienite; 7. granite; 8. limestone; 9. tertiary; 10. diluvial; 11. alluvial. Each of these groups is discussed under the following heads: (a) Chemical and external character; (b) range and extent; (c) elevation and general character of hills; (d) inclination and thickness of the rocks and veins; (e) water and springs; (f) agricultural character; (g) mineral contents; (h) application to useful purposes. Primitive and Tertiary formations are present, but no Secondary.

212. **Mather, W. W.**

Fossil fishes in Connecticut sandstone.

Neues Jahrb., 531-532, 1834.

Specimens of fish turned to bituminous coal, but with scales perfectly preserved, are found twenty miles from New Haven; they occur in bituminous shale, "red marl," and sandstone.

213. **Mather, W. W.**

Geology of New York, Part I (first report on southeastern district). xxxvii + 671 pp., 46 pls., 4°, Albany, 1843.

Glacial striæ and till are noted as occurring in Connecticut, and the origin of the drift deposits is discussed. The traps and sandstone of Connecticut and New York are of the same age; the dip of the sandstone is due to the original deposition by equatorial and polar currents. Identical Cambro-Silurian metamorphic rocks occur in western Connecticut and eastern New York.

214. **Mather, William Williams. (1804-1859.)**

Biography.

Am. Jour. Sci., (2) xxvii, 452, 1859.

215. **Matthew, W. D.**

Monazite and orthoclase, from South Lyme, Connecticut. Sch. Mines Quart., xvi, 231-233, 1895.

Detailed description of a large crystal of monazite.

216. **Mease, J.**

A geological account of the United States, comprehending a short description of their animal, vegetable, and mineral productions, antiquities, and curiosities. iii + 496 + xiv pp., Philadelphia, 1807.

The geological portion comprises 55 pages, 25 of which are devoted to a catalogue of minerals.

Contains exaggerated descriptions of Connecticut scenery.

217. **Merrill, G. P.**

Report on building stone of the United States and statistics of quarry industry for 1880.

Census of U. S., 10th Rept., x, 15-29, 1880.

Description of microscopic structure and mineral composition of some of the more common kinds of building stones. The Connecticut specimens described are hornblende-biotite gneiss from Middletown and sandstone from Portland.

218. **Merrill, G. P.**

The collection of building and ornamental stones in the United States National Museum.

Smithson. Rept., pt. ii, 277-648, 9 pls., 1886.

General description of the minerals of building stones; physical and chemical properties of rocks; classification of rocks; quarrying; weathering and selection of building stones. Rocks described as occurring in Connecticut are serpentine, limestone, dolomite, marble, granite, diabase, sandstone.

219. **Miller, S. A.**

North American Mesozoic and Cenozoic geology and paleontology.

Cincinnati Soc. Nat. Hist., Jour., ii, 140-161, 223-244, 1879; iii, 9-32, 79-118, 165-202, 245-288, 1880; iv, 3-46, 93-144, 183-234, 1881; also issued separately. 338 pp. Cincinnati, 1881.

Contains a compilation of data regarding composition, structure, origin, and fossil contents of the Triassic rocks of Connecticut.

220. **Newberry, J. S.**

Report on building stones of the United States, and statistics of the quarry industry.

Census of U. S., 10th Rept., x, 318-324, 1884.

Limestone of Greenwich mentioned as building stone (was used in the construction of a portion of the wall in Central Park). Thomaston granite well adapted to monumental work; Millstone point granite, fine, dark gray; that of Leete Island, reddish gray, rather coarse-grained

gneiss; that of Stony Creek, pale red in color, medium grain, a strong, compact, handsome stone. Short description also of granite at Winnepauk, Norwalk, and red granite at Lyme, also that at Niantic. Marble of Canaan is mentioned.

221. **Newberry, J. S.**

Fossil fishes and fossil plants of the Triassic rocks of New Jersey and the Connecticut valley.

U. S. Geol. Surv., Mon. xiv, 122 pp., 26 pls., 1888. Abstracts: New York Acad. Sci., Trans., vi, 124, 128, 1887; Am. Jour. Sci., (3) xxxviii, 77-78, 1889; Am. Nat., xxii, 639, 1888; Am. Geol., iv, 187-188, 1889; Pop. Sci. Mon., xxxvi, 562-563, 1889.

Short sketch of the geological relations of the Triassic rocks of New Jersey and the Connecticut valley. Description of the following fossil fishes found in Connecticut: Ischypterus ovatus, W. C. R.; Ischypterus micropterus, n. sp.; Ischypterus tenuiceps, Ag. sp.; Ischypterus fultus, Ag. sp.; Ischypterus parvus, W. C. R. (MS); Ischypterus latus, J. H. R.; Ischypterus minutus, n. sp.; Catopterus redfieldi, Egerton; Catopterus gracilis, J. H. R.; Catopterus minor, n. sp.; Catopterus anguilliformis, W. C. R.; Catopterus parvulus, W. C. R.; Ptycholepis Marshi., Newb.; Diplurus longicaudatus, Newb. Description of the following fossil plants found in Connecticut; Dendrophycus Triassicus, n. sp.; Baiera münsteriana, Ung.; Schizoneura planicostata, Rogers sp.; Pachyphyllum simile, n. sp.; Pachyphyllum brevifolium, n. sp.; Otozamites latior, Saporta; Cheirolepis münsteri, Schimper; Otozamites brevifolius F. Br.; Cycadinocarpus chapini Newb.; Loperia simplex, n. sp.; Clathropteris platyphylla Brong.

222. **Newberry, John Strong. (1822-1892.)**

Biography.

Kemp: Geol. Soc. America, Bull., iv, 393-409, 1892.

Kemp: Sch. Mines Quart., 94-111, Jan., 1893.

Stevenson: Am. Geol., xii, 1-26, 1893.

223. **[Newell, F. H.] U. S. Geological Survey.**

The Connecticut river.

U. S. Geol. Surv., 14th Ann. Rept., pt. ii, 140-146, 1893.

Tables are given showing discharge, rainfall, run-off at Hartford for years 1871-1885; based on observations made by United States Army Corps of Engineers.

224. **[Newell, F. H.] U. S. Geological Survey.**

Connecticut river: A study of the discharge and run-off of the river at Holyoke, Massachusetts, 1880-1895.

U. S. Geol. Surv., Bull. No. 140, 37-41, 1896.

(This is to be compared with the report on the Connecticut river at Hartford, 223.—*Ed.*)

225. **Niles, W. H.**

The geological agency of lateral pressure exhibited by certain movements of rocks.

Boston Soc. Nat. Hist., Proc., xviii, 272-284, 1876. Abstract: Am. Nat., x, 127, 1876.

Evidence obtained from various quarries showing that rocks are in a state of tension or compression. Shown by bulgings, crushings, and explosions when rock is removed from the quarries. Due to lateral pressure occasioned by the contraction of the globe. A general phenomenon. Among other localities observed were those of Waterford and Groton. (See Johnston, 174.)

226. **Norton, H.**

Glacier scratches in Goshen, in northern Connecticut. Am. Jour. Sci., (3) xxii, 322, 1881.

Citation of observations of location and direction of five glacial striae in Goshen, Connecticut, as follows: S41°E; S77°E; S38°E; S22¾°E; S58°E.

227. **Peet, C. E.**

Glacial and post-Glacial history of the Hudson and Champlain valleys.

Jour. Geol., xii, 415-469, 617-660, 27 maps and figs., 1904.

The relation of the Hudson water body to that of the Connecticut valley is briefly discussed.

228. **Percival, J. G.**

Notice of the locality of sulphate of barytes, from which a specimen was analyzed by Mr. G. T. Bowen, and of various other mineral localities in Berlin, Connecticut. Am. Jour. Sci., (1) v, 42-45, map, 1882.

The sulphate of barytes is found in a vein in a ridge of greenstone within the red sandstone formation, about one-half mile west of Kensington meeting house, in Berlin. Mentions a coal mine (in greenstone only), lead mine, pyrites, carbonate of lime, quartz, chalcedony, agate, porous greenstone containing zeolites and chlorite crystals.

229. **Percival, J. G.**

Report on the geology of the state of Connecticut. 486 pp., with map, published under the direction of the Commissioners appointed by the State, 1842.

The geology of Connecticut is discussed under the following heads: Rocks, 10-452; unconsolidated materials, 453-467; soils, 467-470; economic results, 470-475; physical geography, 475-486. The rocks are grouped as Primary system, 11-298, divided into the western Primary system with 16 rock formations, and the eastern Primary system with 5 formations and numerous subdivisions; trap rocks, 299-426; the Secondary rocks, 426-452. The rocks and formations are described in detail, as regards their "mineral composition, structure, and physical character." The characters of the unstratified "Diluvium" and the stratified "Alluvium" are described at many localities.

(Percival's report is a remarkable piece of work. The difficulties under which it was undertaken, and the care with which it was done are explained in the bulletin accompanying the Preliminary Geological Map of Connecticut. The rock types and localities are described accurately,

the igneous origin of the traps is stated, and the fact of transportation of bowlders and the direction of their course is noted. The author described what he saw, and the book is a mass of geological detail. With this abundance of facts, however, there is an absence of generalizations or of an attempt to interpret the phenomena observed, and the report is therefore of little value to the reader who wishes to understand the geological history of Connecticut.— *Ed.*)

230. **Percival, James Gates. (1795-1856.)**

Biography.

Shepard: Atlantic Mon., iv, 59-73, 1859.

Ward: Life and Letters of James Gates Percival. 579 pp., 1866.

Pettee: Meriden Sci. Assoc., Trans., iv, 22-28, 1890.

Cogswell: Percival and his friends. Am. Jour. Sci., (2) xxii, 150-151, 1856.

Geol. Surv. Wisconsin, preface, 1856.

231. **Perry, J. B.**

Hints toward the post-Tertiary history of New England from personal study of rocks, with strictures on Dana's "Geology of the New Haven region."

Boston Soc. Nat. Hist., Proc., xv, 48-148, 1873.

Discussion of the non-adaptability of the iceberg theory to account for all the drift phenomena. Detailed treatment of the glacier theory and its general application to the post-Tertiary history of New England. Discussion of the marl and peat periods of post-Pliocene time. Criticism from time to time of Prof. Dana's article, "Geology of the New Haven Region."

232. **Petros (C. A. Lee).**

The moving rocks of Salisbury.

Am. Jour. Sci., (1) v, 34-36, map, 1822.

Northeast pond and Little pond, now separated by a narrow strip of limestone bowlders, were formerly one water body. Carrying of rocks shoreward by the ice has built this barrier. Between September, 1819, and February, 1821, a rock weighing forty tons was moved shoreward 3 rods, 2 links, leaving a trench behind.

(This is one of the first quantitative statements of the importance of lake ice in transporting material.— *Ed.*)

233. **Pierce, J.**

Chalybeate spring at Litchfield.

Am. Jour. Sci., (1) iii, 235, 236, 1821.

An account of a "copious and perennial spring issuing from an extensive bed of sulphuret of iron," situated on the eastern side of Mount Prospect; exhibits in its course much oxide of iron, ochre, and a white deposit.

234. **Porter, T. D.**

Floetz trap formation in Connecticut and Massachusetts.

Am. Jour. Sci., (1) iv., 241-242, 1822

Brief description of the trap formation in New Haven and vicinity, mentioning their inclusions: zeolites, quartz, prehnite, etc. Slight difference between East and West Rocks and those in the region of East Haven; i. e., no regular jointed structure in latter.

235. **Putnam, B. T.**

Notes on samples of iron ore collected in Connecticut. Census of the U. S., 10th Rept., xv, 83-87, map, 1886.

Magnetic ore not found in the state in sufficient quantities to pay for mining; specular hematite is almost unknown; spathic ore exists in the vicinity of Roxbury, but is not mined; limonite the only ore mined. Description of the Kent mine, the Chatfield mine near Salisbury, the Brookpit or Ore Hill mine, the Porter mine at Lakeville, the Davis or Forbes mine north of Lakeville, and the Chapin mine west of Chapinville. Map showing location of iron mines accompanies these notes; sketch of the Chatfield mine.

236. **Pynchon, W. H. C.**

The ancient lavas of Connecticut.

Connecticut Quart., ii, 309-319, 17 reproductions from photographs, 1896.

Well illustrated, popular account of the trap ridges from Tariffville to New Haven.

237. **Pynchon, W. H. C.**

Some common evidences of glacial action in Connecticut.

Connecticut Quart., iv, 294-302, 10 illus., 1898.

A popular article on glacial action with illustrations taken from Connecticut. Views show striated rock, till, perched bowlder, sand plain, etc.

238. **Pynchon, W. H. C.**

Iron mining in Connecticut.

Connecticut Quart., v. — I. Ores and ore beds, 20-26, 4 illus; II. Smelting, 232-238, 8 illus.; III. Historical sketch, 277-285, 9 illus.; 1899.

An account of all the mines within the state. Character of the ores, methods of mining and smelting. An interesting description of the great importance of the industry during the revolutionary period, its decline and present condition. The Salisbury-Canaan region, with its mines, is described and illustrated in detail.

239. **Pynchon, W. H. C.**

Drilled wells of the Triassic area of the Connecticut valley.

U. S. Geol. Surv., Water-Supp. and Irr. Paper No. 110, pp. 65-94, with sketch map and section, 1905.

A sketch of the principal geological features of the area, followed by descriptions of a considerable number of wells, in which several points of interest are emphasized; the high percentage of mineral matter present in all the water, the general absence of flowing wells.

240. **Rafter, G. W.**

Sewage irrigation.

U. S. Geol. Surv., Water-Supp. and Irr. Paper No. 22, 89 pp., 1899.

Sewage conditions at Bristol, Danbury, Lake Wauramaug, Litchfield, Meriden, and Waterbury; gives population, filterage, and drainage as found in these places.

241. **Rice, W. N.**

On the trap and sandstone in the gorge of the Farmington river at Tariffville, Connecticut.

Am. Jour. Sci., (3) xxxii, 430-433, 1886.

Description of the relations existing between the trap and sandstone in the gorge, proving that the lower sheet of trap is contemporaneous.

242. **Rice, W. N.**

First biennial report of the commissioners of the State Geological and Natural History Survey. 18 pp., Hartford, Connecticut, 1904.

The act establishing the state geological and natural history survey was passed June 3d, 1903. The commissioners met on June 25th, 1903, and appointed William North Rice superintendent. The work undertaken during the first year includes a manual of geology, a geological map, and an investigation of the clays.

243. **Rice, W. N.**

The physical geography and geology of Connecticut.

Connecticut Board of Agric., Rept., 74-112, 2 maps, 1904.

A general sketch of the geology and geography of Connecticut, showing three physiographic divisions. The method of formation of the different rocks is outlined, as is also the geological history.

243a. **Rice, W. N., and Gregory, H. E.**

Manual of Connecticut geology.

Connecticut State Geol. Nat. Hist. Surv., Bull. No. 6, 259 pp., 31 pls., 22 figs., 1906.

This report is divided into four parts: 1. Geography of Connecticut as related to geological structure and history; 2. The Crystalline Rocks, including a discussion of their composition and structure and also a description of the different rock formations of the western and eastern Highlands; 3. The Triassic, including sedimentary rocks and the traps; 4. Glacial Geology. The manual is "an outline of what is known in regard to the geological structure and history of Connecticut."

244. **Ries, H.**

The limestone quarries of eastern New York, western Vermont, Massachusetts, and Connecticut.

U. S. Geo. Surv., 17th Ann. Rept., pt. iii (cont.), 795-811, 1896.

Description of localities and character of the limestones, including the Stockbridge limestone, quarried at Canaan, and used for making lime. Chemical analyses are given.

245. **Ries, H.**

Clays of the United States, east of the Mississippi river. U. S. Geol. Surv., Prof. Paper No. 11, 1-287, 1903.

Clays of Connecticut, and analysis of kaolin found at West Cornwall; clay-working industry around Berlin, Hartford, New Haven, and Middletown; value of clay products in the State.

245a. **Robinson, H. H., and Gregory, H. E.**

Preliminary geological map of Connecticut.

Connecticut State Geol. Nat. Hist. Surv., Bull. No. 7, 39 pp., 1 fig., together with a geological map, 1906.

(See Gregory and Robinson, 124c.)

246. **Rogers, H. D.**

Nature of the dip of the Triassic of the eastern United States.

Am. Jour. Sci., (1) xliii, 170-171, 1842; Assoc. Am. Geol., Trans., 63-64, 1843.

Brief statement to the effect that the dip of the Connecticut sandstone is the result of oblique deposition. This objected to by Lyell and Silliman. The latter mentions upheaval as the cause.

247. **Rogers, H. D.**

Cause of crescent-formed dikes of trap in New Jersey and Connecticut.

Am. Jour. Sci., (1) xlv, 334, 1843.

Brief statement that the crescent form of the trap dikes is in some manner connected with the dip of the stratified rocks which they traverse.

248. **Rogers, H. D.**

Sketch of the geology of the United States.

Geol. Pennsylvania, ii, 741-775, Philadelphia, 1858.

The geology of New England and of the Connecticut valley is briefly compared with that of other regions.

249. **Russell, I. C.**

On the physical history of the Triassic formation in New Jersey and in the Connecticut valley.

New York Acad. Sci., Ann., i, 220-254, 1879.

Description of the Triassic areas of eastern United States, particularly those in New Jersey and Connecticut. Conclusions: 1. The Triassic beds are the borders of one great estuary deposit, the central part of which was slowly upheaved and then removed by denudation; 2. The outbursts of trap must have occurred after the sedimentary beds had been upheaved and eroded; 3. The detached areas of Triassic rock occurring along the Atlantic border from New England to North Carolina seem fragments of one great estuary formation, now broken up and separated through the agency of upheaval and denudation. (See Dana, 46.)

250. **Russell, I. C.**

On the occurrence of a solid hydrocarbon in the eruptive rocks of New Jersey.

Am. Jour. Sci., (3) xvi, 112-114, 1878.

Description of brilliant jet black carbonaceous mineral resembling albertite, in the cavities of amygdaloid trap; comparison with a similar mineral described by Percival as occurring in the trap areas of Connecticut. (See Dana, 44.)

251. **Russell, I. C.**

On the former extent of the Triassic formation in the United States.

Am. Nat., xiv, 703-712, 1880.

The detached areas of Triassic rocks, from South Carolina northward to Connecticut and Massachusetts, are portions of the one great estuary deposit, which has been broken up into separate areas by upheaval and denudation.

252. **Russell, I. C.**

Subaërial decay of rocks, and origin of red color of certain formations.

U. S. Geol. Surv., Bull. No. 52, 1-56, 5 pls., 1889.

Red color of Connecticut sandstones due to coating of quartz grains with ferric oxide in residual clay. Sandstones were "formed from debris of lands that had been long exposed to the action of a warm, moist atmosphere." (See Dana, 68.)

253. **Russell, I. C.**

The Newark system.

U. S. Geol. Surv., Bull. No. 85, 340 pp., 4 figs., 13 pls., 1892.

Summarizes existing knowledge regarding Triassic rocks (Newark System) of Connecticut and other eastern states. The Connecticut valley and Southbury areas are mapped and described. Rocks were deposited in tide-swept estuaries during a period of mild climate. A list of fossils is given. Igneous rocks associated with sediments are dikes, intrusive sheets, and lava flows. The structure of the area is monoclinal, and is controlled by "faults of all degrees of displacement up to many hundreds of feet," as shown by Davis. "Each of the Newark areas [along the Atlantic border] was originally much larger than now, and there is a strong probability that all the areas between Massachusetts and South Carolina were originally united." Newark system is in upper part Jurassic and lower part Triassic. The "Index to the literature of the Newark system" (133-330) is very complete.

254. **Seeley, L.**

Garnet Rock.

Am. Jour. Sci., (1) iii, 241-242, 1821.

A rock in Redding abundantly studded with garnets of various sizes and qualities.

255. **Shaler, N. S.**

Fluviatile swamps of New England.

Am. Jour. Sci., (3) xxxiii, 210-221, 1887. Abstract: Pop. Sci. Mon., xxxiii, 142, 143, 1887.

Discussion of differences between rivers flowing from north to south, and those flowing from south to north. The former have terraces and no swamps; the latter have no terraces and numerous swamps; caused probably by a depression of land at south, thus lowering the grade of north-flowing streams.

(No reference to individual Connecticut streams.— *Ed.*)

256. **Sheldon, J. M. A.**

Concretions from the Champlain clays of the Connecticut valley. 42 pp., 123 figs. of nearly natural size, illustrating the "Stone-Arms Collection." A bibliography relating to works on concretions is also given. Boston, 1900.

Concretions are described from the Connecticut valley, including Hartford and Windsor, Connecticut; they are formed in the clay by robbing the clay of its lime. Analysis shows concretions to be about one-half clay or sand. The process by which concretions are formed is discussed, also the factors which determine their shape.

257. **Shepard, C. U.**

Notice of a mine of spathic iron (steel ore) of New Milford, and of iron works of Salisbury, Connecticut.

Am. Jour. Sci., (1) xix, 311-326, 1831.

History of the New Milford mine, which at first was worked for silver; geology of the region — the iron and quartz exist together as a seam 6-8 feet wide in the gneiss; description of the ore; Salisbury iron works — occurrence of the ore, theory of its origin, history of the opening of the ore, annual yield, etc.

258. **Shepard, C. U.**

A report on the geological survey of Connecticut, 186 pp., published by the State, New Haven, 1837.

This report consists of three parts: 1. An economical report, in which the mineral resources of the state are described under the following heads: — metals; coal; plumbago; gems; polishing and grinding materials; soapstone and potstone; materials for alkaline and earthy salts; material for bricks, pottery, porcelain, and glass; fire stone; fluxes; quicklime and water cement; stove paints; decolorizing carbonaceous slate; material for architecture and decoration; material for flagging, tiling and paving; material for agriculture; mineral springs. 2. Scientific report, in which the minerals and ores occurring in Connecticut are described and classified. 3. A catalogue of the collections, containing 595 specimens.

259. **Shepard, Charles Upham.**

Biography.

Am. Jour. Sci., (3) xxxi, 482, 483, 1886.

260. **Silliman, B.**

Sketch of the mineralogy of the town of New Haven. Connecticut Acad. Arts Sci., Mem., i, 83-96, 1810.

Description of the various geological features of New Haven and its immediate vicinity — sand plain (made from material worn from the surrounding hills); various elevations surrounding the town, both trap, sandstone, and crystallines ("micaceous schistus, magnesian schistus"). (The above article was written in 1806.—*Ed.*)

261. **Silliman, B., and Kingsley, J. L.**

An account of the meteor, which burst over Weston, in Connecticut, in December, 1807, and of the falling of stones on that occasion, with a chemical analysis of the stones.

Connecticut Acad. Arts. Sci., Mem., i, pp. i, 141-161, 1810.

Published earlier in the Connecticut Herald and in Trans. Am. Phil. Soc. of Philadelphia, 1808.

Accounts by Nathan Wheeler, Elihu Staples, and others who witnessed the fall. Original meteor 300 feet in diameter fell in fragments at six localities, the most remote being ten miles apart. Description is given of the stone at large; the pyrites; the malleable iron; the black irregular masses; the crust; the globular bodies. The analysis showed silex 51.5; chloride of iron 38; magnesia 13; oxide of nickel 1.5; sulphur 1.

(This is the first description of an American meteorite in which the phenomena of the fall and the composition of the rock are given. Fragments of this meteor are in Yale University museum.— *Ed.*)

262. **Silliman, B.**

Mineralogical and geological observations on New Haven and its vicinity.

Am. Min. Jour., i, 139-149, 1814. Abstract: Jour. Phys. Chim., lxxv, 75-79, 1812; Am. Jour. Sci., (1) i, 55-56, 1818; Treatise on Mineralogy and Geology, Cleaveland, 555, 1822.

The following geological matters are discussed: Alluvial plain, sandstone, granite; "East and West mountains," Pine Rock, of greenstone; slate of West Haven; magnetic sand on the beach; serpentine; limestone.

263. **Silliman, B.**

Localities of mineral and animal remains and acknowledgment of specimens received.

Am. Jour. Sci., (1) i, 237-243, 1819.

Mention of rose quartz from Southbury; plumbago from Cornwall; coal from Suffield and Southington; sulphate of barytes, with coal, etc.; molybdena from Pettipaug, Saybrook; beryl from Haddam.

264. **Silliman, B.**

Mineralogical and geological observations on New Haven and its vicinity.

Am. Jour. Sci., (1) i, 55-56, 1819.

An account of native copper found in the drift at Wallingford.

265. **Silliman, B.**

Sketches of a tour in the counties of New Haven and Litchfield in Connecticut, with notices of the geology, mineralogy, and scenery.

Am. Jour. Sci., (1) ii, 201-235, 1820.

Conversational description, in diary form, of a tour through western Connecticut, touching at New Haven, Watertown, Goshen, Salisbury, Kent, New Preston, New Milford, Woodbury; mentions Secondary greenstone ranges, Primitive slate rocks, gneiss, granite, limestone, and iron ores; describes the scenery as well as various manufactories, etc.

266. **Silliman, B.**

Remarks made on a short tour between Hartford and Quebec in the autumn of 1819. 407 pp., 12°, New Haven, 1820; 2d ed., 443 pp., 9 pls., New Haven, 1824.

Describes tour from Hartford over Talcott mountain through Canton, New Hartford, and thence up the Farmington river to Massachusetts. The central area of Secondary sandstone and trap or greenstone is described. "The ridges of greenstone repose almost universally upon sandstone." The topography of the trap ridges and the talus slopes is explained. "It is amusing to observe how immediately the materials of the fences and the buildings, so far as they are constructed of stone, change as soon as the geology of the country changes."

The western crystallines are described as gneiss in "high, rounded, Primitive hills."

267. **Silliman, B.**

Remarks on red sandstone of the Connecticut region.

Am. Jour. Sci., (1) iii, 221, 222, 1821.

Mentions general relation of "trap-formation" of New England. Ridges of columnar greenstone trap reposing on red sandstone rock, beneath which lie slaty bituminous rocks; in the latter were found, at Westfield, fish impressions and copper minerals.

268. **Silliman, B.**

Notice of "Geological essays, or an inquiry into some of the geological phenomena, to be found in various parts of America and elsewhere — By Horace H. Hayden, Esq., member of the American Geological Society."

Am. Jour. Sci., (1) iii, 47-57, 1821.

Discussion of Mr. Hayden's theory that the alluvial region skirting the Atlantic Ocean is the result of the operation of currents (whose cause is the deluge of Noah) that flowed from northeast to south-

west, or from north to south, over the whole continent of America. Discusses importance of rock decay and soil formation.

(Well worth reading as indicating the unsettled state of geology at this period.— *Ed.*)

269. **Silliman, B.**

Ice caves at Meriden and Northford.

Am. Jour. Sci., (1) iv, 174-177, 1822.

Account of the ice deposits that are found in the deep ravines and gorges at Meriden and Northford.

270. **Silliman, B.**

Ice caves at Salisbury.

Am. Jour. Sci., (1) viii, 254, 1824.

Account of the ice deposits that are found in the deep ravines and gorges of Salisbury.

271. **Silliman, B.**

Bakewell's Introduction to Geology. Edited by Benj. Silliman; with appendix. Outline of Silliman's course of lectures at Yale. 1st Am. ed., 1829.

Mentions Connecticut river terraces, gorge at Middletown, influence of geological structure on people, intrusive trap, bowlders, East Haven conglomerate, diluvium.

272. **Silliman, B.**

Igneous origin of some trap rock.

Am. Jour. Sci., (1) xvii, 119-131, 1830.

Discusses question of igneous or aqueous origin of trap, particularly at Rocky Hill, 3 miles S. S. W. of Hartford; "this trap is a crystalline, and the sandstone under it a mechanical rock;" "trap deposited and aggregated," "from a state of chemical mobility"; vesicular character of trap described; contact described in detail. "For myself I must say that the effects that have been produced both upon the trap and the sandstone . . . are such as I can attribute to no agent but fire." . . . "The effects on both rocks are just such as . . . we must expect from intense heat acting under great pressure."

(If this early work of Silliman had been kept in mind, and his method of investigation followed, there probably would never have been two contradictory opinions regarding the origin of the trap rock of Connecticut.— *Ed.*)

273. **Silliman, B.**

Notice of a report on the geological survey of Connecticut, by Prof. C. U. Shepard.

Am. Jour. Sci., (1) xxxiii, 151-175, 1837.

Largely an extended abstract of Shepard's report, 258.

274. **Silliman, Benjamin.** (1779-1864.)

Biography.

Fisher: Life of Benjamin Silliman, 2 vols., New York, Scribner and Co., 1866.

Dana: Am. Jour. Sci., (2) xxxix, 1-10, 1865.
Caswell: Nat. Acad. Sci., Mem., i, 101-112, 1877.
Pop. Sci. Mon., xxiii, 259-266, 1883.

275. **Silliman, B., Jr.**

Dr. Percival, the original discoverer of the crescent-formed dikes of trap in the New Red sandstone of Connecticut.

Am. Jour. Sci., (1) xlvi, 205-206, 1844.

Credit given to Percival to correct a misunderstanding.

276. **Silliman, B., Jr.**

Report on the intrusive traps of the New Red sandstone of Connecticut.

Am. Jour. Sci., (1) xlvii, 107, 108, 1844: Assoc. Am. Geol., Proc., 14, 15, 1844; Neues Jahrb., 728, 729, 1845.

Abstract of the conclusions concerning the origin and formation of the sandstone and trap of Connecticut. Sandstones laid down in "angular position," dipping easterly; igneous dikes entered sediments far below surface; present topography due to enormous northerly current.

277. **Silliman, B., Jr.**

On fossil trees found at Bristol, Connecticut, in the New Red sandstone.

Am. Jour. Sc., (2) iv, 116-118, 1847.

Description of two fossil coniferous trees found in a sandstone quarry on the banks of the Pequabuck river near Bristol.

278. **Silliman, B., Jr., and Whitney, J. D.**

Notice of the geological position and character of the copper mine at Bristol, Connecticut.

Am. Jour. Sci., (2) xx, 361-368, 1855.

(See Whitney and Silliman, 296.)

279. **Smith, A.**

On the water courses and the alluvial and rock formations of the Connecticut river valley.

Am. Jour. Sci., (1) xxii, 205-231, map, 1832.

Statement of the course and extent of the valley of the Connecticut. General discussion of the disintegration of primitive rock strata into gravel, sand, clay. Mention of the Primitive (crystalline) formation. Description of the Secondary (sandstone and trap) formation and discussion of its origin.

280. **Smock, J. C.**

Geological-geographical distribution of the iron ores of the eastern United States.

Am. Inst. Min. Eng., xii, 130-144, 1884.

The Connecticut ores discussed are magnetite, Laurentian, Fairfield

county; titaniferous magnetite, Huronian, "in gneiss in Connecticut"; limonite, Lower Silurian, Litchfield county; iron coloring the Triassic sandstones and shales.

281. Stodder, C.

On the occurrence of clay on the banks of the Farmington river, Connecticut.

Boston Soc. Nat. Hist., Proc., vi, 138-139, 1857.

Description of clay concretions or segregations in clay on the Farmington river, Windsor.

282. United States Geological Survey.

The following titles of papers issued by the United States Geological Survey are listed under the names of the authors: —

Davis, 83, 98; Emerson, 112, 113; Fuller, 119; Gannett, 120, 121; Gregory, 123, 124; Hobbs, 155, 156, 159; Knowlton, 180; Marsh, 206; Newberry, 221; [Newell], 223, 224; Pynchon, 239; Rafter, 240; Ries, 244, 245; Russell, 252, 253; Walcott, 288.

MINERAL RESOURCES OF THE UNITED STATES (OLD SERIES).

1882, nickel, cobalt, 401 (history of the mine in Chatham). "Ores, minerals, and mineral substances of industrial importance which are at present mined" are feldspar, flagging stone, granite, limonite, marble, sandstone, trap. Localities given, 672. Ores, etc., "which are not at present mined" are apatite, arsenopyrite, agate, barite, beryl, bismuth, bornite, calamine, cassiterite, chalcocite, chalcopyrite, corundum, clay, galenite, garnet, graphite, hydraulic limestone, limonite, magnetite, malachite, molybdenite, niccolite, pyrite, pyrrhotite, quartz, rutile, siderite, smaltite, sphalerite, talc, topaz, uraninite. Localities given, 672-674.

1883-1884, cobalt, 544; feldspar, 933; mica, 908; mineral waters, 908; tungsten, 574.

1885, building stone, 397; fertilizers, 469; iron, 182; lime, 410; mineral waters, 537; precious stones, 439.

1886, granite, 537; iron, 14, 17, 42; mineral waters, 716; structural materials, 522.

1887, granite, 573; iron, 11; lime, 532; minerals, 714.

1888, list, with localities, of minerals and rocks mined and not mined, 714-716; brick, 558, 566; granite, 536; iron, 14; lime, 555; mineral waters, 626, 630.

1889-1890, brown hematite, 40; granite, 374, 385; iron, 10, 17, 24, 35, 36; limestone, 373, 385, 386 (analysis); mineral waters, 522; sandstone, 374, 385.

1891, clay, 502; granite, 457, 458; iron, 12, 27, 61; limestone, 464, 465; mineral waters, 603, 604; sandstone, 401.

1892, beryl, 766; granite, 706, 707; iron, 26, 34; limestone, 711; mineral waters, 824, 826; sandstone, 710; topaz, 764.

1893, granite, 545; infusorial earth, 678; iron, 26, 28, 35; limestone, 555; mica, 753; mineral waters, 774, 776, 787; sandstone, 553; stone at World's Columbian Exposition, 562.

1894-1895, granite, 459; limestone, 496; sandstone, 486; iron, 192.

ANNUAL REPORTS.

1894-95, pt. iii, iron ore, 192, 201; pt. iv, granite, 459; limestone, 496; mineral waters, 712; sandstone, 486.

1895-96, pt. iii, granite, 764; limestone, 792, 802; mineral waters, 1032; sandstone, 779.

1896-97, pt. v, brownstone (analyses), 1030; feldspar, 1365; granite, 957; limestone, 1049; mineral waters, 1377; sandstone, 1017-1021.

1897-98, pt. vi, clay, 354; feldspar, 657; granite, 208, 213, 232; limestone, 280, 283, 287; mineral springs, 661, 667; Portland cement, 487, 492; quartz, 657; sandstone, 264-267.

1898-99, pt. vi, clay, 515; feldspar, 693; granite (analyses and tests), 277, 362, 364; limestone (analyses), 346, 370; mineral waters, 756; quartz, 588; sandstone (analyses and tests), 339, 365-369; tourmaline, 577; trap (analyses and tests), 364, 365; tungsten, 594.

1899-1900, pt. vi, beryl, 450; clay, 362, 363; garnet, 467; granite, 336-340; limestone, 357-360; mineral waters, 598, 607; sandstone, 353, 365; silicified wood, 455; stone, 335.

MINERAL RESOURCES OF THE UNITED STATES (NEW SERIES).

1900, clay, 695, 698, 728; feldspar, 895; flint, 895; granite, 662, 664, 667; infusorial earth, 794; iron ores, 43, 57; limestone, 662, 685; lithiophilite, 242; mineral waters, 901; pig iron, 96; pottery, 715; sandstone, 662, 670, 673; scheelite, 258; spodumene, 241; tourmaline, 761; trap, 666.

1901, barytes, 915; clay, 674-677, 711; feldspar, 938; flint, 936; granite, 650; ilmenite, 272; infusorial earth, 798; iron, 60, 76, 100, 103; limestone, 667; mica, 875; mineral waters, 962; monazite, 950; pig iron, 86; pottery, 700; quartz, 800; rutile, 272; sandstone, 656; stone, 643; trap, 654; tripoli, 798; tungsten, 263.

1902, barytes, 945; brick, 719; clay, 707, 747, 757; corundum, 831, 886; essonite, 837; feldspar, 973; flint, 972; granite, 678; iron, 43, 59, 67, 68; limestone, 698; marble, 693; mica, 985; mineral waters, 996; pig iron, 86, 87; pottery, 734, 738; quartz, 883; sandstone, 684; stone, 669; tourmaline, 841; tile, 719; trap, 669; tungsten, 286.

1903, ammonia, 629; asbestos, 1112, 1114; brick, 796, 809; clay, 796, 860; coal tar, 624; feldspar, 1119; flint, 1117; granite, 758, 766, 768; garnet, 1005; gas, 611, 619, 622; iron, 43, 59, 67, 68; limestone, 758, 786; marble, 758, 781; mineral waters, 1139; pig iron, 93-95; pottery, 796, 809; quartz, 1004; sandstone, 758, 770; spodumene, 313; steel, 103, 104, 106; tourmaline, 926; tile, 796, 809; trap, 769; tungsten, 307.

1904, ammonia, 669; asbestos, 1137; bismuth, 375; brick, 863, 871; clay, 850, 859; coal tar, 664; columbite, 1225; feldspar, 1144; flint, 1143; gas, 654, 662; granite, 805; iron, 40, 53, 62; limestone, 805; marble, 805; mica, 1175, 1181; mineral waters, 1187, 1190; molybdenum, 339; pig iron, 79; pottery, 882, 892; quartz, 998, 1009; sand, 1149; sandstone, 80, 805; steel, 88, 91, 101; tourmaline, 942, 954; tile, 863, 871; trap, 805; tungsten, 333.

WATER SUPPLY AND IRRIGATION PAPERS.

The following papers, published by the U. S. Geological Survey as Water-Supply and Irrigation Papers, contain statistical matter more or less closely related to geology: —

No. 35, 1900. Daily readings of height of Connecticut river at

Hartford, given for period February 8, 1896, to December 31, 1899, inclusive, 42-44.

No. 44, 1901. Profiles of rivers in the United States, 12-14. Discusses and illustrates profiles of Connecticut and Housatonic rivers from source to mouth.

No. 47, 1901. Daily readings in height of the Connecticut river at Hartford given for the year 1900, and for Housatonic at Gaylordsville from October 23 to December 31, 1900, 35.

No. 65, 1902. Daily readings of height of the Housatonic at Gaylordsville from October 23, 1900, to December 31, 1901; also list of undeveloped water powers along that stream, 87-90.

No. 75, 1903. Table and diagram of monthly discharge of Housatonic at Gaylordsville, 24.

No. 76, 1903. Housatonic river; quality of water, 84, 85; daily gage height, 1900-02 inclusive, 93-95; current meter discharge measurements, 104.

No. 82, 1903. Daily readings of Connecticut river at Hartford for the year 1902, 48, 49.

No. 97, 1904. A study of the Connecticut River drainage basin, including daily gage height at Hartford for 1903, 80-83; the Mianus river near Stamford for 1903, 94-114; Byram river at Pemberwick, Greenwich, and Riverville for 1903, 118-124.

No. 124, 1905. Daily gage reading of Connecticut river at Hartford, for 1904, 121-122; daily gage reading of the Housatonic at Gaylordsville, 147-152; of Shetucket near Willimantic for 1904, 112-113.

No. 144, 1905. Distribution of chlorine in ground water, and tables showing determinations for the state, 22-28, map.

No. 149, 1905. List of deep well borings in Connecticut, 23-24.

283. **Upham, W.**

The succession of Glacial deposits in New England.
Am. Assoc. Adv. Sci., Proc., xxviii, 299-310, 1880.

Description of the occurrence and extent of the various drift deposits,— till, stratified deposits, moraines, etc., of New England. Discussion of origin. No description of any particular glacial phenomena of Connecticut.

284. **U[pham],W.**

[Abstract of] "Some typical eskers of southern New England," by J. B. Woodworth.
Am. Geol., xiv, 396, 1894.

Woodworth's article states that eskers were deposited in channels of drainage upon, in, or beneath the waning ice-sheet. (See Woodworth, 301.)

285. **Valcherville, M. de.**

Highland Park, Manchester.
Connecticut Quart., i, 299, 1895.

Describes the old Wyllys copper mine.

286. **Walcott, C. D.**

The Taconic system of Emmons, and the use of the name Taconic in geologic nomenclature.

Am. Jour. Sci., (3) xxxv, 229-242, 307-327, 394-401, map and section, 1888. Abstract: Nature, xxxvii, 500, 1888. Review by J. Marcou: Am. Geol., ii, 10-23, 67-88, 1888.

This exhaustive discussion of the Taconic question is subdivided as follows: 1. The Taconic area and geologic work within it; 2. Geology of the Taconic area as known at the present time; 3. Geology of the Taconic area as known to Dr. Emmons; 4. Comparison and discussion; 5. Nomenclature. (See Emmons, 115.)

287. **Walcott, C. D.**

Synopsis of conclusions on the "Taconic of Emmons." Internat. Cong. Geol., Rept. Am. Comm., 25-29, 1888; Am. Geol., ii, 215-219, 1888.

Name Taconic "based on error and misconception originally, and used in an erroneous manner since"; and should not be used as indicating stratigraphic position.

(See also, Walcott, 286.)

288. **Walcott, C. D.**

Correlation papers, Cambrian.

U. S. Geol. Surv., Bull. No. 81, 1-447, 3 pls., 1891.

Historical review of the geologic and paleontologic work, and summary of the present knowledge of the Cambrian areas of North America. Mention of the quartzite of Canaan.

289. **Warren, J. C.**

Geological position of the Mastodon.

Boston Soc. Nat. Hist., Proc., iii, 111, 1849.

Brief mention of the remains of mastodons found in Connecticut, "about midway between the Connecticut River and the Hudson."

290. **Webster, J. W.**

Localities of minerals, observed principally in Haddam in Connecticut, in September, 1819.

Am. Jour. Sci., (1) ii, 239, 240, 1820.

Mention of tourmaline and epidote in mica slate and gneiss; chrysoberyl in a granite vein traversing the gneiss, containing also garnet and tourmaline; actinolite in mica slate; all of the above near Haddam. Globular concretion of gneiss near Jewett City; tourmaline at Bozrah; transparent garnets at Tolland, also graphite.

291. **Wells, D. A.**

On the Connecticut valley sandstone formations.

Boston Soc. Nat. Hist., Proc., iii, 339-340, 1850.

The upper members of the Connecticut River sandstones are of an entirely different age from the lower. This is evidenced by the limitation of the fossils to the upper beds, and by the different lithological characters.

292. **Wells, D. A.**

On the origin of stratification.

Boston Soc. Nat. Hist., Proc., iv, 108-110, 1851; Am.

Assoc. Adv. Sci., Proc., vi, 297-299, 1852.

The shales and sandstones of the Connecticut Triassic are cited to prove that all strata are not produced either by an interruption of deposition or by a change in the quality of the material deposited.

293. **Wells, D. A.**

Evidences of glacial action in southeastern Connecticut.

Pop. Sci. Mon., xxxvii, 196-201, 1890.

Description of several large glacial bowlders in the region between Groton and Noank, at Fisher's island, and near Norwich.

294. **Wells, D. A.**

Remarkable bowlders.

Pop. Sci. Mon., xl, 340-346, 1892.

Description of several large bowlders occurring at Montville, about midway between Guilford and Leete Island, and in Massachusetts.

295. **Westgate, L. G.**

A granite-gneiss in central Connecticut.

Jour. Geol., vii, 638-654, 4 figs., map, 1899.

The gneiss at Maromas is shown to be igneous; its field relations and petrography are described in detail.

296. **Whelpley, J. D.**

Trap and sandstone of the Connecticut valley.

Assoc. Am. Geol., Proc., vi, 61-64, 1845.

Originally the sandstone area covered the Housatonic and Connecticut valleys and the space between. Woodbury and larger portions in Connecticut valley preserved because they had hard trap dikes in them. These dikes "acted as so many dams and headwaters against the denuding flood," thus protecting the sandstone. The crescentic form of dikes is due to irregularities of vent.

297. **Whitney, J. D., and Silliman, B., Jr.**

Notice of the geological position and character of the copper mine at Bristol, Connecticut.

Am. Jour. Sci., (2) xx, 361-368, 1855.

The mine is situated at the contact of the sandstone and the metamorphic rocks. The copper ore ("vitreous and variegated" types with some copper pyrites) is obtained from the micaceous and hornblende slates, talcose micaceous slate, and sandstone. A history of the mine is given; opened in 1836; not worked extensively until 1846. The sandstone is of Liassic age, and the metamorphic rocks belong to the Paleozoic system.

298. **Whittle, C. L., and Davis, W. M.**

The intrusive and extrusive Triassic trap sheets of the Connecticut valley.

Mus. Comp Zoöl., Bull., xvi, 99-138, 1 pl., 1889.

(See Davis and Whittle, 100.)

299. **Williams, S.**

Observations and conjectures on the earthquakes of New England.

Am. Acad. Arts Sci., Mem., i, 260-311, 1785.

The paper is divided into two parts: 1. An historical account of earthquakes of 1638, 1658, 1663, 1725, 1755, and of several minor shocks; 2. Causes of earthquakes.

300. **Winchell, N. H.**

Comparative strength of Minnesota and New England granites.

Am. Assoc. Adv. Sci., Proc., xxxii, 249, 250, 1884.

Abstract of article showing by a series of comparative tests that the Minnesota granites are stronger than those of New England. The Connecticut granites tested came from Mystic river, Stony Creek, Millstone point, Greenwich, New London.

301. **Woodworth, J. B.**

Some typical eskers of southern New England.

Boston Soc. Nat. Hist., Proc., xxvi, 197-220, 1894.

The typical eskers of southern New England are most easily explained by assuming a subglacial origin, but certain ones demand a channel open to the sky; esker at Compounce Pond described; others in Connecticut mentioned.

302. **Author unknown.**

[Review of] "Outline of the geology of England and Wales, with an introductory compendium of the general principles of the science and comparative views of the structures of foreign countries. By Rev. W. B. Conybeare and William Phillips. Pt. I, 470 pp., London, 1822."

Am. Jour. Sci., (1) vii, 203-240, 1824.

Comparison of the red sandstone of Connecticut with the marl and Old Red sandstone of England.

303. **Author unknown.**

What constitutes the Taconic range of mountains?

Am. Geol., vi, 247, 1 pl., 1890.

Quotations from Dr. Asa Fitch, Prof. J. D. Dana, and Mr. C. D. Walcott, in order to verify the claims of Dr. Emmons as to what constitutes the Taconic range of mountains.

LIST OF MAPS.

500. **Blake, W. P., and Hitchcock, C. H.**

Geological map of the United States.

Atlas of the U. S. and the world by Gray, folio, Philadelphia, 1871; Statistics of mines and mining in the states and territories west of the Rocky mountains, 5th report by R. W. Raymond, Washington, 1873; Statistical atlas of the United States based on results of the 9th Census, 1870, pls. xiii, xiv, Washington, 1875; Special report for the Centennial, 1876; Smithson. Contr. Knowl., 1876; Die Vereinigten Staaten von Nord-Amerika (F. Ratzel), i, München, 1878.

Connecticut is marked "Eozoic" except the Connecticut valley and Pomperaug areas of "Jurassic and Triassic" rocks. Note states: "There may be some metamorphic Palæozoic formations included in the Atlantic portions of the Azoic."

501. **Bradley, F. H.**

Geological chart of the United States east of the Rocky mountains and of Canada. Folder, 16 by 24 inches, New York, 1875.

The formations shown in Connecticut are: Archæan, all that part of the state east of the Triassic; Lower Silurian, nearly all of western Connecticut; Upper Silurian, in eastern Litchfield and western Hartford county; Triassic, central Connecticut and Southbury. Scale approximately 1 inch=90 miles.

502. **Chapin, J. H.**

Map showing the triangulation of Connecticut, by the United States Surveys.

Meriden Sci. Assoc., Trans., iv, 51, 1890.

Scale, ⅔ inch=10 miles.

503. **Crosby, W. O.**

Map of the proposed sites of the dams in the valley of the Housatonic and of the Tenmile river.

Tech. Quart., xiii, No. 2, 123, 1900.

A topographic map, showing the relations of the Tenmile and Housatonic valleys, extending from Dover Plains to Pawling, including part of the Housatonic river in Connecticut. Scale 1 inch=2 miles.

504. **Dana, J. D.**

Topographic map of the New Haven region.

Connecticut Acad. Arts Sci., Trans., ii, 45, 1873.

Extends north from the Sound to include Mount Carmel. Includes Woodbridge hills on the west, and lake Saltonstall on the east.

The various elevations are indicated by hachures. Rivers, railroads, and a few roads are indicated. Scale $\frac{4}{10}$ inch=1 mile.

505. **Dana, J. D.**

Map of the New Haven region.

Am. Jour. Sci., (3) x, 171, 415, 1875.

Embraces a tract about four miles on each side of the harbor, extending north, including Mount Carmel. Shows geography and some topography. Scale $\frac{4}{10}$ inch=1 mile.

506. **Dana, J. D.**

Map of the Connecticut valley and part of the coast of southern New England.

Am. Jour. Sci., (3) x, 499, 1875; xxv, pl. v, 1883.

Gives main geological features and some topography of an area along the Connecticut river from Northampton south; 5 to 12 miles on the east side, 20 to 35 miles on the west side. Scale approximately 1 inch= 12 miles.

507. **Dana, J. D.**

Map of Dutchess and the adjoining counties of eastern New York, with a portion of western Connecticut and southwestern Massachusetts.

Am. Jour. Sci., (3) xvii, 379, 1879.

Locates the limestone belts of western Connecticut, about 12 miles wide, down to about 3 miles south of New Fairfield. Scale $\frac{1}{10}$ inch= 1 mile.

508. **Dana, J. D.**

Map of limestone areas of Westchester county, New York.

Am. Jour. Sci., (3) xx, pl. v, 1880.

Takes in that part of Connecticut west of the line running south from Danbury, and south of a line running west from that town. Locates the limestone areas in color. Scale 1 inch=3 miles.

509. **Dana, J. D.**

Map of limestone areas of Dutchess, Westchester, and Putnam counties, New York, and part of western Connecticut, with the Archæan of Putnam county and the Palisade trap range.

Am. Jour. Sci., (3) xx, pl. viii, 1880.

Includes that part of Connecticut west of a line running north and south at a distance of about 10 miles east of Salisbury. Locates the limestone areas. Scale 1 inch=10 miles.

510. **Dana, J. D.**

Section of the Connecticut river during the flood from the melting glacier.

Am. Jour. Sci., (3) xxiii, pl. ii, 1882.

Includes the central portion of Connecticut, extending at the south from a little west of New Haven to a little east of the mouth of the Connecticut. Approximately the same width at the northern part of the

state. Transverse section of river bed also given. Scale 1 inch=20 miles.

511. **Dana, J. D.**

Geological sketch map of the Taconic range.

Geol. Soc. London, Quart. Jour., xxxviii, pl. xvii, 1882.

Map of Taconic area from Burlington, Vermont, to New York City. Connecticut formations are mapped as Archæan, crystalline limestone and Taconic schists. Scale approximately 1 inch=5 miles.

512. **Dana, J. D.**

Map of the New Haven region.

Am. Jour. Sci., (3) xxvi, 342, 1883.

Includes area south of Mount Carmel, and between Saltonstall on the east and Woodbridge heights on the west. Principal topographic features marked; also streets and roads. Outline of the flood-made terrace is indicated. Scale $\frac{1}{10}$ inch=1 mile.

513. **Dana, J. D.**

Map of the New Haven plain, showing its original features.

Am. Jour. Sci., (3) xxvii, pl. ii, 1884.

Includes the plain on which the city is built and the adjoining hills. Extends as far north as Centerville, and south to just below mouth of West river. Gives outline of terrace area, river channels, and kettle-holes. Elevations indicated by figures. Scale 2 inches=1 mile.

514. **Dana, J. D.**

Map of the southern end of a great synclinal in the Taconic range.

Am. Jour. Sci., (3) xxviii, pl. iii, 1884.

Locates limestone, mica schist, and some ore pits of the area immediately around, and to the west and north of Salisbury. Scale 8 inches=1 mile.

515. **Dana, J. D.**

Geological sketch map of the Taconic region, southern part.

Am. Jour. Sci., (3) xxix, pl. ii, 1885.

Locates schist, gneiss, quartzite, and limestone of northwestern Connecticut. Scale ½ inch=1 mile.

516. **Dana, J. D.**

Maps of the New Haven region.

Am. Jour. Sci., (3) xlii, 79-110, 1891.

Pl. I. Map of New Haven. Shows topography of the region by hachures. Scale 1 inch=2½ miles. Pl. II. Map of the New Haven region before 1640. Location, in color, of East Rock, Mill Rock, Pine Rock, and the southern part of West Rock. Location of kettle-holes and terraces and old creek beds. Elevations given. The part of the city mapped is the original half-mile square bounded by George, State, York, and Wall streets. The northern part of the harbor is included. Scale 1 inch=2 miles. Pl. III. Map of East Rock. A detailed geological map of East Rock, including Snake Rock and Whitney peak. Scale 1 inch=800 feet. Pl. VI. West Rock. Scale 1

inch=400 feet; contour interval 20 feet. Fig. 1. Map of Pine Rock. Scale 1 inch=1,000 feet. Fig. 5. Map of Mill Rock. Scale 1 inch=1,000 feet. Fig. 16. Wintergreen notch. Page 44. Trap areas of central Connecticut. Scale 1 inch=8 miles. Page 82. Map of Round hill and vicinity. Scale 1 inch=½mile. Page 112. Stony Creek and the Thimbles. Scale 1 inch=½ mile.

See also, The Four Rocks of the New Haven Region. New Haven, 1891.

517. **Dana, J. D.**

Map of the Triassic of Connecticut, from Hartford down to the Sound. Reproduction of part of Percival's map.

Am. Jour. Sci., (3) xlii, pl. xvi, 1891.

Scale approximately 1 inch=6 miles.

518. **Davis, W. M.**

Sketch maps of Hanging Hills and trap sheet at Beckley station.

Mus. Comp. Zoöl., Bull., vii, pl. x, 1884.

519. **Davis, W. M.**

Modification of a portion of Percival's geological map of Connecticut (1842).

U. S. Geol. Surv., 7th Ann. Rept., 1887.

Locates, in color, the Triassic area of central Connecticut; principal trap ridges are indicated. Scale 1:503000.

520. **Davis, W. M.**

Sketch maps of trap ridges.

U. S. Geol. Surv., 7th Ann. Rept., 1877.

Trap ridges near South Britain, fig. 97; trap near Woodbury, fig. 99; Pond, Totoket, and Paug mountains, fig. 102.

521. **Davis, W. M.**

Sketch map of Massachusetts, Connecticut, and Rhode Island, giving location of Triassic area, and of ridges near Meriden.

Am. Jour. Sci., (3) xxxvii, 424, 1889.

522. **Davis, W. M.**

Outline map of southern New England.

Mus. Comp. Zoöl., Bull., xvi, pl. i, fig. 1, 1889.

Shows the Triassic area of the lower Connecticut valley (dotted) and Meriden area (black square). Scale 1 inch=100 miles.

523. **Davis, W. M.**

Sketch maps of faulted areas in Triassic.

Mus. Comp. Zoöl., Bull., xvi, 1889.

Lamentation mountain, fig. 2; Shuttle Meadow reservoir, fig. 3; faulted Triassic monocline, Meriden, fig. 9; Lamentation mountain, Chauncy peak, and Higby mountain, fig. 10a; Hanging Hills, fig. 11; area from Cook's gap to Short mountain, fig. 13; trap ridges and faults in the Meriden-New Britain district, fig. 16.

524. **Davis, W. M.**

Diagrammatic map of the Cretaceous peneplain in New England.

Geol. Soc. America, Bull., ii, 551, 1891.

Shows general location of Triassic lowlands and crystalline areas of the whole of Connecticut; also of middle and western Massachusetts, and western New York. Scale about 1 inch=90 miles.

525. **Davis, W. M.**

Sketch map of the Triassic area of Connecticut.

Am. Jour. Sci., (4) i, 2, 1896.

Locates main trap ridges and fault lines.

526. **Davis, W. M.**

Sketch maps and diagrams illustrating structure in the Triassic area.

U. S. Geol. Surv., 18th Ann. Rept., pt. ii, 1-192, 1898.

Uplands and lowlands, fig. 1; trap ridges, fig. 5; abnormal fault causing Vineyard gap, fig. 24; marginal faults and Lamentation fault block, fig. 25; South Glastonbury and South Manchester corners, fig. 32; trap ridges near southwest end of Lamentation block, fig. 33; conse quent Jurassic drainage, fig. 36; antecedent Triassic drainage, fig. 37; drainage on the Cretaceous peneplain, fig. 40; pre-Glacial drainage fig. 50; existing drainage of the Connecticut Triassic area, fig. 51; Quinnipiac and Mill river headwaters, fig. 52.

527. **Davis, W. M.**

Geological map of the Triassic area of Connecticut.

U. S. Geol. Surv., 18th Ann. Rept., pt. ii, pl. xix, 1898.

Locates, in color, the following formations: Upper sandstones, posterior trap sheet, posterior sandstones and shales, main trap sheet, anterior sandstones and shales, anterior trap sheet, tufaceous deposits, under sandstones, intrusive trap sheets, dikes, crystalline areas. Locates also lines of faulting. Scale 1 inch=2 miles; contour interval 100 ft.

528. **Davis, W. M., and Griswold, L. S.**

The Connecticut valley Triassic area, and a portion of crystallines on either side.

Geol. Soc. America, Bull., v, 520, 1894.

Principal trap ridges indicated. Faults along eastern boundary and within Triassic shown. Scale 1 inch=20 miles.

529. **Davis, W. M., and Loper, S. W.**

Sketch map of about ten square miles near Meriden.

Geol. Soc. America, Bull., ii, 423, 1891.

Show parts of Highby, Chauncy, Lamentation, and Quarry blocks. Localities of fossiliferous anterior and posterior shales indicated.

530. **Davis, W. M., and Whittle, C. L.**

Map of Triassic area in Connecticut from Long Island Sound to the north bend of the Farmington river.

Mus. Comp. Zoöl., Bull., xvi, 137, pl. i, 1889.

Based on Percival's map of Connecticut. Gives location of trap ridges and main geographic features. Scale 1.35 inches=10 miles.

531. **Davis, W. M., and Whittle, C. L.**

Sketch maps of Triassic trap ridges.

Mus. Comp Zoöl., Bull., xvi, 137, pl. iii, 1889.

Adjacent ends of Saltonstall and Totoket mountains, fig. 2; north end of Totoket mountain, fig. 3; Higby mountain, fig. 4; Chauncy peak, south end of Lamentation mountain, and Quarry ridge, Meriden, fig. 5; Notch mountain and eastern ridges of the Hanging Hills, fig. 6; Farmington mountain and its anterior ridge, fig. 7; Farmington river gap at Tariffville, fig. 8; Rock falls of Aramamit river, fig. 9; north end of Lamentation mountain, fig. 10; posterior ridges of Saltonstall mountain, fig. 11.

532. **Dewey, C.**

A geological map of the county of Berkshire, Massachusetts, and of a small part of the adjoining states.

Am. Jour. Sci., (1) viii, 1, 1824.

The northwest corner of Connecticut is mapped. The following formations are represented in color: mica slate, primitive limestone, quartz rock.

533. **Dorsey, C. W., and Bonsteel, J. A.**

Soil map of the Connecticut valley.

U. S. Dept. Agric., Bur. Soils, Rept. Field Oper. for 1899, 1900.

Connecticut area mapped extends from Glastonbury to the Massachusetts line, with a width of 5 to 10 miles. Different types of soil are shown in color. Scale 1 inch=1 mile; base used is topographic map of 1893.

534. **Eggleston, J. W.**

Map of Woodstock pond, Connecticut.

Am. Jour. Sci., (4) xiii, 404, 1902.

Locates kames, kettle-holes, eskers, and terraces. Scale 1 inch= 1,500 feet.

535. **Emerson, B. K.**

Holyoke folio.

U. S. Geol. Surv., Geol. Atlas of U. S., Folio No. 50, 1898.

Topographic, historical, superficial and economic geology sheets of a strip about 2½ miles wide along the northern edge of Connecticut, between the meridians 72° 30′ and 73°. Locates, in color, the following formations: Washington and Becket gneisses, Hoosac schist, Chester amphibolite, Sugarloaf arkose, Longmeadow sandstone, Holyoke diabase, Chicopee shale, and Glacial deposits. Scale 1 inch=2 miles.

536. **Emerson, B. K.**

Map of an area in West Norfolk.

U. S. Geol. Surv., Bull. No. 159, pl. v, 1899.

Detailed geological map, with section, of the Norfolk railroad cut, also map showing geology of region adjoining. Scale 1 inch=1 mile.

537. **Emerson, B. K.**

Map of eastern half of Housatonic quadrangle.

U. S. Geol. Surv., Bull. No. 159, pl. ix, 1899.

Geological map of that part of Connecticut found on the Sandisfield topographic sheet; includes northern halves of Colebrook and Norfolk, with parts of Hartland and North Canaan. Scale approximately ½ inch=1 mile.

538. **Fippin, E. O.**

Soil map of the Connecticut valley.

U. S. Dept. Agric., Bur. Soils, Rept. Field Oper. for 1903, 1904.

Map of soil types in Massachusetts and Connecticut. The Connecticut area mapped is on the Springfield, Granville, Hartford, Granby, Middletown, and Meriden topographic sheets. Base map is the topographic atlas of Connecticut. Scale 1 inch=1 mile.

539. **Gregory, H. E.**

Map showing water-supplies in areas of limestone, sandstone, and crystalline rock, of Connecticut.

U. S. Geol. Surv., Water-Supp. and Irr. Paper No. 114, fig. 17, 1905.

Scale 1 inch=25 miles.

539a. **Gregory, H. E., and Robinson, H. H.**

Preliminary geological map of Connecticut.

Connecticut State Geol. and Nat. Hist. Surv., Bull. No. 7.

The base map, which was prepared especially for the present purpose, shows contours (100 feet), towns, streams, roads, etc. The geological formations, 42 in number, are shown in color. Quarries and clay pits are also located. The map is chiefly designed to differentiate rock types, and only seven formations are assigned to definite ages. Scale 1 inch=4 miles.

(This is the first geological map of Connecticut issued since 1842. See Percival, 578. It is based on data supplied by several workers, and represents the present state of knowledge regarding the bed-rock geology of southern New England.— *Ed.*)

539b. **Gregory, H. E., and Rice, W. N.**

Maps and diagrams illustrating Connecticut geology.

Connecticut State Geol. and Nat. Hist. Surv., Bull. No. 6.

(See Rice and Gregory, 582a.)

540. **Griswold, L. S., and Davis, W. M.**

The Connecticut valley Triassic area.

(See Davis and Griswold, 528.)

541. **Hall, J., and Logan, W. E.**

Geological map of Canada and the United States.

(See Logan and Hall, 566.)

542. **Hitchcock, C. H.**

Geological map of United States and part of Canada.

Am. Inst. Min. Eng., Trans., xv, 486, 1886.

Laurentian, Silurian and Triassic areas of Connecticut, are indicated in color. Scale ⅞ inch=100 miles.

543. **Hitchcock, C. H., and Blake, W. P.**

Geological map of the United States.

(See Blake and Hitchcock, 500.)

544. **Hitchcock, E.**

A geological map of the Connecticut valley.

Am. Jour. Sci., (1) vi, facing p. 1, 1823.

Hand-colored map of the region adjoining the Connecticut valley from Bellows Falls to New Haven. The area mapped in Connecticut is bounded on the west by a line from West Hartford to Milford; on the east by a line from Stafford to Saybrook. Formations shown are granite (at Branford), gneiss, hornblende slate, mica slate, chlorite slate, Primitive greenstone, argillite, Old Red sandstone, Secondary greenstone, Coal formation, alluvion. Section near New Haven shows dikes in Old Red sandstone. Scale 1 inch=7 miles.

(The boundaries of formations as shown on this map are only approximately those drawn by later observers. Map is dated 1822. —*Ed.*)

545. **Hitchcock, E.**

Geological map of Massachusetts.

Am. Jour. Sci., (1) xxii, pl. 1, 1832.

Includes a strip about 5 miles wide along the north edge of Connecticut. Represents in color the following formations: mica slate, argillaceous and flinty slate, limestone, scapolite rocks, gneiss, hornblende slate, granite, New Red sandstone, greenstone, Tertiary, talcose slate. Scale approximately 4½ inches=30 miles.

546. **Hitchcock, E.**

Map of the course of bowlders and striæ in North America.

Assoc. Am. Geol., pl. vii, 1843.

Includes northeastern United States, and a portion of Canada.

547. **Hitchcock, E.**

Geological map.

Smithson. Contr. Knowl., ix, pl. iii, 1857.

Surface geology, chiefly of the Connecticut valley. Includes a strip 10-15 miles on each side of the Connecticut river. Locates, in color, terraces, beaches, old river beds, ledges of rock, submarine ridges, old sea bottom, osars.

548. **Hobbs, W. H.**

Geological map of the northwest corner of Connecticut.

Jour. Geol., i, pl. ii, 1893.

Map includes an area of 26 square miles in the northwest corner of the state,— one-third of the town of Salisbury, a portion of eastern New York, and southwestern Massachusetts; shows areas of Everett schist, Egremont limestone, Riga schist, Canaan limestone. Scale 1 inch=1 mile.

549. **Hobbs, W. H.**

Geological map of portions of Sheffield, Massachusetts, and Salisbury, Connecticut.

Jour. Geol., i, 785, 1893.

Map of a portion of the Housatonic valley east of Mount Washington. The geological structure is indicated. Shows areas of quartzite, Egremont limestone, Everett schist, Riga schist, Canaan dolomite, tremolitic limestone. Scale 1 inch=1 mile.

550. **Hobbs, W. H.**

Geological map of the Pomperaug valley, Connecticut.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, pl. i, 1901.

Locates, in color, the following formations: Schist, gneiss, granite, conglomerate, sandstone, shale, basalt (anterior), shale and limestone (anterior), basalt (main), basalt (vesicular); also fault lines. Scale 1 inch=1 mile; contour interval 20 feet.

551. **Hobbs, W. H.**

Areas occupied by the Newark system.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, pl. ii, 1901.

Trap and sediments of the Newark system in Connecticut located. Scale 1 inch=120 miles.

552. **Hobbs, W. H.**

Geological map of the vicinity of South Britain, Connecticut.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, pl. viii, 1901.

Locates, in color, the following formations: Sandstone, conglomerate, gneiss (higher, lower), arkose (higher, lower), shale (anterior), basalt (higher, lower, lowest), shale (posterior); also fault lines and cold springs. Scale 4 inches=1 mile.

553. **Hobbs, W. H.**

Geological map of Orenaug hill, Woodbury, Connecticut.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, pl. x, 1901.

Locates, in color, the following formations: Gneiss (higher, lower), arkose (higher, lower), basalt (higher, lower, lowest), shale (posterior), hornblende rock, sandstone, conglomerate; also cold springs and faults. Scale 1 inch=¼ mile.

554. **Hobbs, W. H.**

Topographic map of the Pomperaug valley, Connecticut.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, pl. xiv, 1901.

Embraces an area 7½ miles east and west by 10 miles north and south (approximately). Scale 1 inch=1 mile; contour interval 20 feet.

555. **Hobbs, W. H.**

Map to illustrate the supposed stages in the erosion history of the Pomperaug basin, in the cycle which was ini-

tiated by the elevation and tilting of the Cretaceous plain of erosion.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, pl. xvii, 1901.

556. **Hobbs, W. H.**

Maps and diagrams, Pomperaug valley.

U. S. Geol. Surv., 21st Ann. Rept., pt. iii, 1901.

Newark areas of southern New England, p. 31; Pomperaug valley and vicinity, p. 33; trap ridges near South Britain, p. 35; trap ridges near Woodbury, p. 36; Oliver Mitchell brook, p. 41; development of the anterior basalt, p. 43; development of the main basalt, p. 45; Red spring, p. 52; Spring house section, p. 86; western basin wall, p. 87; contact along fault, p. 88; Mitchell's spring, western boundary of East hill, p. 91; William Curtis place, p. 92; fault bounding Horse and Pine hills, p. 102; Castle Rock, p. 111; southern part of the Pomperaug basin, p. 118; strike and dip observations in crystalline rocks, p. 123; topography of ridges, Southbury, p. 150; deep inglenook, Square Rock, p. 151; oblique inglenook, South Britain, p. 152; fault system of the Pomperaug valley, pl. ix; relation of drainage to faults, pl. xv; structure of the basin of the Shepaug river, pl. xvi.

557. **Hobbs, W. H.**

River map of the area surrounding the Pomperaug valley.

Jour. Geol., ix, 477, 1901.

Rivers have been traced from the U. S. Geological Survey atlas sheets, which are on a scale of one inch to the mile. Observed faults (extended) are shown, as are also the inferred approximate positions of joint or fault planees. Scale ½ inch=1 mile.

558. **Hobbs, W. H.**

River map of Connecticut.

Jour. Geol., ix, 468, 1901.

This map, reduced from the two-sheet topographic map of Connecticut, shows the prominent "trough lines" and their trend. Scale 1 inch=12½ miles.

559. **Hobbs, W. H.**

Map of the (Farmington) Still river and vicinity.

Geol. Soc. America, Bull., xiii, fig. 1, 1901.

Area immediately around Torrington, Winsted, and Robertsville. Locates drift barriers, limestone, ponded areas. Scale ½ inch=1 mile; contour interval, 20 feet.

560. **Hobbs, W. H.**

Map of the (Housatonic) Still river and vicinity.

Geol. Soc. America, Bull., xiii, figs. 2, 3, 1901.

Area immediately around Danbury, Bethel, and New Milford. Locates drift, limestone, schist. Sketch map showing development of Still river. Scale ½ inch=1 mile; contour interval, 20 feet.

561. **Hobbs, W. H.**

Geological map of the tungsten mine near Long hill, Connecticut.

U. S. Geol. Surv., 22d Ann. Rept., pt. ii, pl. i, 1901.

Locates, in color, hornblende gneiss, crystalline limestone, pegmatites, mica schist, quartz-hornblende-scheelite-epidote rock; also strike, dip, joints. Scale 1¾ inches=500 feet; contour interval 10 feet.

562. **Hobbs, W. H.**

Geological map of the vicinity of the Trumbull mine, Connecticut.

U. S. Geol. Surv., 22d Ann. Rept., pt. ii, pl. ii, 1901.

Locates schist-gneiss complex, hornblende gneiss, crystalline limestone. Scale 1¾ inches=1 mile; contour interval 20 feet.

563. **Hobbs, W. H.**

Sketch map of the Pomperaug valley, showing the distribution of the terrace deposits and of basalt trains.

Am. Jour. Sci., (4) xiv, 401, 1902.

Scale 1 inch=2 miles.

564. **Hobbs, W. H.**

Drainage system of Connecticut.

Geol. Soc. America, Bull., xv, pl. 46, 1904.

Shows rivers of Connecticut, and network of "lineaments" which control their course. Scale 1 inch=10 miles.

565. **Hovey, E. O.**

Map of the trap ridges of the East Haven region.

Am. Jour. Sci., (3) xxxviii, pl. ix, 1889.

Locates Pond Rock (Saltonstall ridge), and the smaller ridges within two miles of it; also south end of Totoket mountain and boundary of Triassic. Scale ½ inch=5,000 feet.

566. **Logan, W. E., and Hall, J.**

Geological map of Canada and the United States, from Hudson Bay to Virginia, and from the Missouri river to Newfoundland. Montreal, 1866; also on smaller scale in atlas to "Geology of Canada," 1863.

Review: Am. Jour. Sci., (2) xlix, 294-298, 1866.

Connecticut is left blank except the Connecticut valley "Trias," the limestone areas marked "Lévis" (Lower Silurian), and the schist of Salisbury marked "Lauzon." A carefully made colored map. Scale approximately 1 inch=25 miles.

567. **Loper, S. W., and Davis, W. M.**

Sketch map of about 10 square miles near Meriden.

(See Davis and Loper, 529.)

568. **Loughlin, G. F.**

Map of Glacial deposits in central Connecticut.
Connecticut State Geol. Nat. Hist. Surv., Bull. No. 4, pl. i, 1905.

Map of area from Massachusetts line to New Haven, and from Middletown to Southington. Areas of till, sand, high gravels, alluvium, clay of economic value, are shown. Scale approximately 1 inch=2 miles.

569. **Lyman, B. S.**

A conjectural map of the Connecticut and Massachusetts New Red sandstone.
Am. Phil. Soc., Proc., xxxiii, 202, 1894.
Scale 1 inch=16 miles.

570. **McGee, W. J.**

Map of the United States, exhibiting the present status of knowledge relating to the areal distribution of geologic groups. (Preliminary compilation.)
U. S. Geol. Surv., 5th Ann. Rept., for 1883-84, pl. ii, 1885.

Locates the eastern and western highlands of Connecticut as Archæan except a small area of Silurian in the northwestern part of the state. Locates also the central Jurassic-Triassic formation.

571. **Maclure, W.**

Geological map of the United States east of the Mississippi, accompanying "Observations on the geology of the United States."
Am. Phil. Soc., Trans., vi, 1809.

Connecticut colored as Primitive rocks, or uncolored, except two areas of Secondary, one reaching from Long Island Sound to Hartford, the other an oval area west of the Naugatuck. Base map used is by Samuel G. Lewis. Scale approximately 1 inch=90 miles.
(This is the earliest geological map of the eastern part of the United States.—*Ed.*)

572. **Maclure, W.**

Geological map of the United States, accompanying "Observations on the Geology of the United States."
Am. Phil. Soc., Trans., (new series) i, pl. i, 1818, Abraham Small, Philadelphia, 1817.

In this second edition of Maclure's map the same formations are indicated in Connecticut as were shown in the first edition; viz., Primitive and Old Red sandstone. (This map reproduced in 1822 by P. Cleaveland, in "An Elementary Treatise on Mineralogy and Geology," 2d ed., Boston; and by Charles Moxon in "The Geologist," for 1843, London.— *Ed.*) Scale 1 inch=120 miles.

573. **Marcou, J.**

Geological map of the United States and the British provinces of North America.

Boston, Gould and Lincoln, 1853; Petermann, Mittheil., i, pl. xv, 1855; Soc. Geol. France, (2d series) xii, 1853; Geology of North America, Zurich, 1858.

Triassic shown as New Red sandstone or Keuper containing an area of copper trap. The rest of the state shown as eruptive and metamorphic rocks. Scale approximately 1 inch=90 miles.

(The formations are poorly located and poorly bounded. There seems little excuse for such crude mapping of Connecticut geology 13 years after the publication of Percival's Report.—*Ed.*)

574. **Martin, D. S.**

Geological map of New York city and vicinity, accompanied by a pamphlet of explanatory text. New York, 1888.

A part of Connecticut west of a line from Greenwich to Banksville is marked "Atlantic or Manhattan gneiss, age disputed." A belt of limestone projects into this area from the north. Scale 1 inch=2 miles.

575. **Mather, W. W.**

A geological map of Windham and New London counties.

Sketch of geology of New London and Windham counties, by W. W. Mather, 1832.

Ten bed-rock formations are shown in color, as are also quarries and mines of stone, iron, peat, clay, plumbago, and mineral springs. Two sections accompany the map. Scale approximately 1 inch=5 miles.

576. **Merrill, G. P.**

Map of the marble regions of western New England. Smithson. Rept., pl. vii, 1886.

Includes the western part of Connecticut. The following formations are indicated: Archæan or Primitive, Potsdam, limestone, slate or gneiss.

577. **Percival, J. G.**

Map of Connecticut — east and west sections of Kensington, in Berlin.

Am. Jour. Sci., (1) v, 42, 1822.

Gives locality of sulphate of barytes, coal, lead, zeolites, shale; greenstone and sandstone ridges, alluvial flat; stalactites, quartz crystals, granite block, vein of carbonate of lime; mills, bridges, roads, etc.

578. **Percival, J. G.**

A geological map of Connecticut.

Report on the geology of the state of Connecticut. Published by the Legislature, New Haven, 1842.

The base map shows rivers, lakes, divides between streams, and

town boundaries. The geological boundaries are shown by dotted lines. The Secondary formations are separated from the Primary, and the divisions of the Primary are indicated by numbers, by Roman and Greek letters, and by various other characters. The trap of the Secondary and of the Primary are indicated, even to the small dikes. Scale approximately 1 inch=5½ miles.

(Considering the base map used and the area covered, probably no more accurate piece of geological mapping has ever been accomplished by a single individual.—*Ed.*)

579. **Petros (C. A. Lee).**

Map of two lakes, Salisbury.

Am. Jour. Sci., (1) v, 34-37, 1822.

Map of two lakes (Northeast and Little ponds); showing islands, swamp lands, moving bowlders.

580. **Putnam, B. T.**

Map showing location of iron mines east of the Hudson river.

Census of U. S., 10th Rept., xv, fig. 8, p. 83, 1886.

The map covers a portion of Litchfield county; southwestern portion of Berkshire county, Massachusetts, and Dutchess and Columbia counties, New York. Shows one mine in Connecticut, that in Kent. Scale 1 inch=1 mile.

581. **Pynchon, W. H. C.**

Map of the northwestern corner of Connecticut.

Connecticut Quart., v, 279, 1899.

Includes towns of Salisbury, Canaan, North Canaan, Sharon, and Cornwall. Shows topographic features and location of iron mines and furnaces.

582. **Rice, William North.**

Maps of Triassic areas.

Connecticut Board of Agric., Rept. for 1903, 98, 107, 1904.

One map of western Connecticut and Massachusetts, showing Triassic; another of trap areas in the vicinity of Hartford, Middletown, and Meriden.

582a. **Rice, W. N., and Gregory, H. E.**

Maps and diagrams illustrating Connecticut geology.

Connecticut State Geol. and Nat. Hist. Surv., Bull. No. 6.

Figure 1. Geological map of central Connecticut. Highland and lowland distinguished. Scale 1 inch=10 miles. Plate xiv. Preliminary geological map of Connecticut. A simplified edition of 539a. Scale 1 inch=6 miles. Plate xv. Triassic areas of eastern North America. Scale approximately 1 inch=120 miles. Plate xxiv. Map showing trap sheets and faults in central part of Triassic area of Connecticut. A clearly drawn map in black and white, slightly altered from Davis, 527. Scale 1 inch=2 miles. Figure 15. Sketch map showing faults near East Berlin. Scale 1 inch=1200 feet. Figure 17. Relations of

trap sheet, fault and river at Tariffville. Figure 19. Map of glacial striæ in Connecticut. Scale approximately 1 inch=20 miles. Figures 20-22. Three maps of the Farmington river and tributaries, showing pre-Glacial drainage, Glacial modifications, and present stage of development. Scale approximately 1 inch=20 miles.

582b. **Robinson, H. H., and Gregory, H. E.**

Preliminary geological map of Connecticut.

Connecticut Geol. and Nat. Hist. Surv., Bull. No. 7.

(See Gregory and Robinson, 539a.)

583. **Russell, I. C.**

Maps of the Connecticut valley sandstone areas.

U. S. Geol. Surv., Bull. No. 85, pls. i, iii, 1892.

Map of areas occupied by Newark system. Scale 1 inch=120 miles. Map of Triassic of the Connecticut valley, giving sedimentary, trap rock, and pre-Newark areas. Scale ⅓ inch=5 miles.

584. **Smith, Alfred.**

The Connecticut river valley.

Am. Jour. Sci., (1) xxii, 205, 1832.

Includes a strip about forty miles wide through the central part of Connecticut, showing the extent of the Primitive and Secondary formations. Scale 2½ inches=40 miles.

585. **United States Geological Survey.**

Map of the United States, exhibiting the progress made in the geographic survey.

U. S. Geol. Surv., 5th Ann. Rept., pl. i, 1883-84.

Shows the triangulation areas of Connecticut; also the area surveyed by other organizations than the U. S. Geological Survey.

586. **United States Geological Survey.**

Topographical atlas of the state of Connecticut.

United States Geológical Survey in coöperation with the state of Connecticut. 1893.

An atlas consisting of 33 sheets covering Connecticut and parts of adjoining states. 1893. Scale 1 inch=1 mile; contour interval, 20 feet.

(This is the only complete atlas of Connecticut in existence. For a history and description of this map, see Connecticut State Geol. Nat. Hist. Surv., Bull. No. 7. The map may be obtained from the State Librarian, either bound or in separate sheets.—*Ed.*)

587. **United States Geological Survey.**

Topographic map of Connecticut.

United States Geological Survey in coöperation with the state of Connecticut. 1893.

A two-sheet wall map. Scale 1 inch=2 miles; contour interval 100 feet.

(Map may be obtained from the State Librarian unmounted or mounted on muslin with rollers.—*Ed.*)

588. **Walcott, C. D.**

Geologic map of portions of eastern New York, western Vermont, western Massachusetts, and northwestern Connecticut.

Am. Jour. Sci., (3) xxxv, pl. iii, 1888.

Formations mapped are: pre-Cambrian, Cambrian (Georgia, Potsdam); Calciferous, Chazy, Trenton; Hudson; Quaternary. Scale 1 inch =10 miles.

589. **Westgate, L. G.**

Map of a granite-gneiss area.

Jour. Geol., vii, 639, 1899.

Map of the Maromas granite-gneiss area on the Connecticut river, below Middletown. Shows inclusions, quarries, dip and strike. Scale 1 inch=1 mile.

590. **Whittle, C. L., and Davis, W. M.**

Map of the Triassic area in Connecticut.

(See Davis and Whittle, 530.)

591. **Whittle, C. L., and Davis, W. M.**

Maps of Triassic trap ridges.

(See Davis and Whittle, 531.)

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